FEBRUARY 16, 1957 PAGES 333 TO 382

Sect. 8

THE LANCET

Offices: 7, ADAM STREET, ADELPHI, W.C.2
Telegrams: LANCET, RAND, LONDON Telephone: TEMPLE BAR 7228 and 7229

No. VII OF VOL. I. 1957 LONDON, SATURDAY, FEBRUARY 16, 1957 Pp. 112—Price 1s. 6d.
No. 6964 VOL. CCLXXII Founded 1823 PUBLISHED WEEKLY Registered as a Newspaper Annual Subscription: £3 3s.

The Climacteric

"... *A mixture of the male and female hormones was more efficacious than oestrogen alone.*"
BRIT. MED. JOURN., 1953 (JULY 25), 2, 214

MEPILIN
TRADE MARK

Each Mepilin Tablet and each teaspoonful (4 ml.) of Mepilin Elixir contains ethinylœstradiol 0.01 mg. and methyltestosterone 3 mg.

TABLETS Bottle of 25 at 4/- and 100 at 12/-
ELIXIR Bottle of 4 fl. oz. at 6/- and 500 ml. at 20/6
Basic N.H.S. prices

Literature and specimen packings are available to physicians on request

THE BRITISH DRUG HOUSES LTD. (Medical Department) LONDON N.1

Now in its Second Edition

VARICOSE VEINS
By R. ROWDEN FOOTE
Price 55s. net, by post 1s. 5d. extra
". . . has now won its place as a standard work."
—*New Zealand Medical Journal.*
Butterworths, 88, Kingsway, London, W.C.2

Revised Edition

ENDOCRINE DISORDERS IN CHILDHOOD AND ADOLESCENCE
By H. S. LE MARQUAND, M.D., F.R.C.P., F. H. W. TOZER, M.D., M.R.C.P., and W. J. TINDALL, M.D.
367 pages 90 photographic plates
32s. 6d. net, plus 1s. 4d. postage
English Universities Press Ltd., 102, Newgate-street, E.C.1

HOW TO WORK—
ADVICE TO STUDENTS STARTING MEDICINE.
An address to the London Hospital Medical Society.
By A. E. CLARK-KENNEDY, M.D. Camb., F.R.C.P.
Demy 8vo. 16 pages. Price 1s.
The Lancet Limited, 7, Adam-street, Adelphi, London, W.C.2

Second Edition

THE CARE OF TUBERCULOSIS IN THE HOME
By JAMES MAXWELL, M.D., F.R.C.P.
Physician, Royal Chest Hospital; Physician to the Ministry's Mass X-ray Unit; Consulting Physician, Royal National Sanatorium, Bournemouth; late Physician, St. Bartholomew's Hospital.
Demy 8vo 114 + xii Illustrations 7s. 6d. net, plus 5d. postage
Hodder & Stoughton Ltd., 20, Warwick-square, London, E.C.4

SUPERANNUATION FOR THE GENERAL MEDICAL PRACTITIONER
By HUGH D. BARRY, Barrister-at-Law
"This book may be read in an hour but it is essentially one to have to hand for consultation at the appropriate moment . . ."
—*British Medical Journal.*
24 pages 2s. 6d. net
Wm. Heinemann Medical Books Ltd., 99, Gt. Russell St., W.C.1

TECHNIQUES IN PHYSIOTHERAPY
Edited by
F. L. GREENHILL, S.R.N., M.C.S.P. [illegible] T.T.
late Sister-in-Charge, Medical Rehabilitation [illegible], Royal Free Hospital; late Sister-in-Charge, Rehabilitation Unit, Hill End E.M.S. Hospital (St. Bartholomew's); Former Member Council of Chartered Society of Physiotherapy.
Assisted by
C. B. HEALD, C.B.E., M.D., F.R.C.P., in Rheumatism and Arthritis.
J. N. BARRON, F.R.C.S., in Burns and Injuries of the Hand.
Mr. J. COLSON, M.C.S.P., M.A.O.T., Occupational Therapy in Medicine and Surgery.
Demy 8vo Pages 222 + x 8 plates 34 figures
12s. 6d. net, plus 1s. 2d. postage.
Hodder & Stoughton Ltd., 20, Warwick-square, London, E.C.4

MANAGEMENT OF BURNS
Six articles prepared by a subcommittee of the BRITISH ASSOCIATION OF PLASTIC SURGEONS
Reprinted from THE LANCET *with an appendix*
These articles record the practice of surgeons who are treating burns every day and who see the good results of treatment that is carefully planned from the start. Here is their plan, fully but briefly set out.
48 pages Price 2s. 6d. (postage 4d.)
The Lancet Limited, 7, Adam-street, Adelphi, London, W.C.2

FIVE NEW BOOKS

HALE-WHITE'S MATERIA MEDICA, PHARMACOLOGY AND THERAPEUTICS
New (Thirtieth) Edition
By A. H. DOUTHWAITE, M.D., F.R.C.P.
24s.

INJURIES OF THE HAND
By RONALD FURLONG, M.B., B.S., F.R.C.S.
99 Illustrations. 36s.

PRINCIPLES OF EPIDEMIOLOGY
By IAN TAYLOR, M.D., M.R.C.P., D.P.H., and JOHN KNOWELDEN, M.D., D.P.H. 25 Illustrations. 30s.

KINETICS AND THERMODYNAMICS IN BIOCHEMISTRY
By H. GEOFFREY BRAY, D.Sc., and KENNETH WHITE, B.Sc., Ph.D., A.R.I.C. 71 Illustrations. 42s.

THE CHEMISTRY AND BIOLOGY OF PURINES
A Ciba Foundation Symposium
124 Illustrations. 48s.

J. & A. CHURCHILL LTD., 104 GLOUCESTER PLACE, LONDON, W.1

REMEMBER AURALGICIN: *in children and adults, it relieves pain rapidly — and safely*

The ephedrine in AURALGICIN produces decongestion. Combined with anhydrous glycerin, it reduces pressure — and relieves pain. Discomfort from irritation and pain is entirely eliminated by the dual analgesic effect of benzocaine and chlorbutol. Potassium hydroxyquinoline sulphate not only takes care of a wide range of pathogens but, together with glycerin, provides an effective barrier against re-invasion. Presentation: In bottles containing 12.5 ml. Price (Basic NHS): 2/9 per bottle.

*be ready with Auralgicin**

EARDROPS FOR ACUTE OTITIS MEDIA

BENGER BENGER LABORATORIES LIMITED · HOLMES CHAPEL · CHESHIRE *Trade Mark

FEB. 16, 1957 PAGES 333 TO 382

THE LANCET

A JOURNAL OF BRITISH AND FOREIGN MEDICINE, SURGERY, OBSTETRICS, PHYSIOLOGY, PATHOLOGY, PHARMACOLOGY, PUBLIC HEALTH, AND NEWS

No. 6964 LONDON: SATURDAY, FEBRUARY 16, 1957 CCLXXII

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ORIGINAL ARTICLES

Chemical Carcinogens and Their Significance
J. W. COOK, D.SC., F.R.S..... 333
Response to Alcohol in Chronic Alcoholics with Liver Disease
W. H. J. SUMMERSKILL, M.R.C.P.
S. J. WOLFE, M.D.
C. S. DAVIDSON, F.A.C.P..... 335
Acute Polyneuritis Treated with Cortisone
G. S. GRAVESON, M.R.C.P.... 340
Massive Thrombophlebitis
B. N. CATCHPOLE, F.R.C.S... 343
Induction of Labour to Prevent Recurrent Stillbirth Due to Hæmolytic Disease
WILLIAM WALKER, M.D.
SHEILAGH MURRAY, M.D.
J. K. RUSSELL, M.R.C.O.G... 348
The Correlation Between Urinary Œstrogen and Vaginal Cytology
STRETTON YOUNG, M.B.
R. D. BULBROOK, PH.D.
F. C. GREENWOOD, PH.D.... 350
Pregnancy in the Diabetic Mother with Nephritis
T. E. OPPÉ, M.R.C.P.
DAVID YI-YUNG HSIA, M.D.
Prof. S. S. GELLIS, M.D..... 353
Nephrotic Syndrome
I. P. ROSS, M.R.C.P.
J. H. ROSS, M.R.C.P..... 354
A Giant Diverticulum of the Bladder
A. GREVILLE YOUNG, F.R.C.S.E. 355

SPECIAL ARTICLES

Casual Exposure of Nurses to X Radiation
B. E. GODFREY, B.SC.
S. B. OSBORN, B.SC.
DAPHNE TEMPLETON, M.S.R. 363
Joint Consultants Committee... 364
N.H.S. Supplementary Estimate 365

PUBLIC HEALTH

Mortality: a Changing Pattern
J. A. FARRER, M.B..... 365

REVIEWS

Notices of Books..... 356

LEADING ARTICLES

CLINICAL PICTURE OF SICKLE-CELL DISEASE..... 357
KERATINOUS CYSTS IN THE C.N.S. 358
"DOCTOR"..... 359

ANNOTATIONS

Training the Assistant..... 360
Cancer and Atherosclerosis..... 361
Progress in Microscopy..... 361
Auto-antibodies in Rheumatism 362
Anæsthesia for Burned Children 362

BEFORE OUR TIME

Thomas Lawrence..... 367

THE WIDDICOMBE FILE

XXXVIII. Curriculosis..... 367

LETTERS TO THE EDITOR

Neonatal Cold Injury (Dr. J. W. Farquhar)..... 371
Hypertension: Presymptomatic Diagnosis and Treatment (Dr. John Hambling; Dr. G. Schoenewald)..... 372
Interaction of Depolarising and Non-depolarising Relaxants (Dr. R. J. Hamer Hodges, Dr. F. F. Foldes)..... 373
Home Care for Sick Children (Dr. J. A. Gillet)..... 373
"Doctor" (Dr. C. Swan; Mr. F. Hilton, PH.D.)..... 373
The Plight of Hospital Pharmacy (Mr. David White, M.C.S.P.)... 374
Sepsis in the Newborn (Dr. Laetitia Bruce, Dr. Gerald Neligan)..... 374
The Rh Blood-groups (Dr. A. S. Wiener)..... 374
Towards Preventing Suicide (Dr. T. S. Davies)..... 375
Radioactive Vitamin B_{12} in the Diagnosis of Neurological Disorders (Dr. C. C. Booth, Dr. D. L. Mollin)..... 375
Birthdays of Spastics (Dr. R. T. Bevan)..... 375
Pneumothorax in Tracheotomy (Dr. J. G. Wilson)..... 375
A Missed Fracture (Dr. T. A. A. Hunter)..... 376
Shortage of Radiographers (Mr. D. R. Gould, F.S.R.)..... 376
Amiphenazole (Dr. J. W. Dundee) 376
Practitioner and Local Authority (Dr. C. W. Dixon)..... 377
Unmarried Parenthood (Dr. E. C. Cordeaux)..... 377
Syringe Carrier (Dr. L. H. Lerman)..... 377
Eradication of Tuberculosis (Dr. H. R. Thomson)..... 377
Tetraethyl Lead Poisoning (Dr. G. L. Robinson)..... 378
Three Cases of Dysuria (Dr. H. I. Howard)..... 378
Treatment of Post-herpetic Neuralgia (Dr. Ronald Harris).... 378
Pulled Elbow (Mr. D. F. Thomas, F.R.C.S.)..... 379
Repair of Femoral Hernia (Captain J. F. Hickey, L.R.C.P.I.).. 379
Neurone Selection in Relief of Pain (Prof. T. Lehoczky, M.D.) 379
Dangerous Contaminants in Stored Blood (Dr. Read Aidin) 379
An American in Britain (Captain E. P. Taxay, M.D.)..... 379

PARLIAMENT

Capital Punishment..... 369
Domiciliary Services for Old People..... 369
Question Time..... 369

IN ENGLAND NOW

A Running Commentary by Peripatetic Correspondents .. 370

OBITUARY

Douglas Robert MacCalman 380

NOTES AND NEWS

Committee on Radiology..... 381
A Journal of Medical History... 381
S.H.M.O.s Undertaking Consultant Duties..... 381
Hospitals in Northern Ireland... 381
International Society of Internal Medicine..... 381
University of London..... 381
Diary of the Week..... 382
Appointments..... 380

NEW FEBRUARY PUBLICATIONS

FUNDAMENTALS OF CLINICAL NEUROPHYSIOLOGY
By PAUL O. CHATFIELD. 384 pages, 225 illustrations. 63s.

OCCUPATIONAL THERAPY: Principles and Practice
By W. R. DUNTON and S. LICHT. *Second Edition.* 384 pages, 34 illustrations. 60s.

ABDOMINAL TOTAL HYSTERECTOMY—A New Technique: The Posterior Approach
By FRANK MUSGROVE. 32 pages, 10 plates. 10s. 6d.

MANUAL OF ANAESTHESIOLOGY FOR RESIDENTS AND MEDICAL STUDENTS
By H. SCHWARTZ *et al.* 176 pages, 12 illustrations. 32s. 6d.

THE GENESIS OF THE RAT SKELETON
By D. G. WALKER and Z. T. WIRTSCHAFTER. 70 pages, 70 plates. 57s. 6d.

PSYCHIATRIC EDUCATION AND PROGRESS
By J. C. WHITEHORN. 56 pages. 12s. 6d.

BLACKWELL SCIENTIFIC PUBLICATIONS · OXFORD

Haagensen's

Diseases of the Breast

". . . the most important book on diseases of the breast which has appeared for many years. . . . It will command attention from all who are interested in its subject."—THE LANCET.

By C. D. HAAGENSEN, M.D., *Professor of Clinical Surgery, College of Physicians and Surgeons, Columbia University.* 785 pages, with 962 illustrations. **£5 12s.**

Friedberg's

Diseases of the Heart

"The second edition of this well-known textbook . . . maintains the high standard set by the first . . . is of great value to students and senior practitioners alike."—THE LANCET.

By CHARLES K. FRIEDBERG, M.D., *Assoc. Clinical Professor of Medicine, College of Physicians and Surgeons, Columbia University* New (2nd) edition. 1161 pages. **£6 6s.**

HANDBOOK OF BIOLOGICAL DATA. Prepared under the direction of the Committee on the Handbook of Biological Data, the National Academy of Sciences, The National Research Council. Edited by WILLIAM S. SPECTOR. 620 pages. **52s. 6d.**

An unparalleled collection of quantitative data covering the whole field of biology. Everyone interested in the biological and medical sciences will welcome this remarkable new book as *the "Bible" on standard values and norms* that they require in their daily work.

PEDIATRIC CARDIOLOGY. By ALEXANDER S. NADAS, M.D., *Assistant Clinical Professor of Pediatrics, Harvard Medical School; Cardiologist, The Children's Hospital, Boston.* NEW. 587 pages, with 343 illustrations. **£4 4s.**

W. B. SAUNDERS COMPANY LIMITED *7, Grape Street, LONDON, W.C.2*

Nutritional Value of Proteins

The nutritional value of proteins depends on their amino-acid composition. If all essential amino-acids are present, the protein will support growth and is described as a first-class protein. Not all proteins belong to this group, and the vegetable proteins in particular tend to be low in one or more amino-acids. If these constituents are provided from some other source, however, the value of the deficient protein is improved.

Marmite provides a mixture of amino-acids and polypeptides, obtained by autolysis from the yeast cell. Within the limits of the amount consumed, the addition of Marmite to the diet thus increases its amino-acid content, and upgrades the nutritional value of the available proteins. Moreover Marmite, being a yeast extract, supplies all the known factors of the vitamin B complex, some of which may be short in predominantly vegetarian or otherwise restricted diets.

MARMITE yeast extract

MARMITE LIMITED, 35 SEETHING LANE, LONDON, E.C.3.

IF THERE IS NO ORGANIC DISEASE TO ACCOUNT FOR

ENURESIS

TREATMENT BY

The "CHIRON" NOCTURNAL ENURESIS ALARM

(PROV. PAT. NO. 16125)

IS INDICATED

THIS TREATMENT IS BASED ON PAVLOV'S THEORY OF CONDITIONED REFLEXES AND HAS PROVED SUCCESSFUL IN 90% OF CASES

SEE LANCET, 19 FEB. 55, P. 391 & 26 MAR. 55, P. 676.

FOR FURTHER INFORMATION WRITE TO:—

DOWN BROS. and MAYER & PHELPS LTD.

Surgical Instrument Makers

32-34, New Cavendish Street, London, W.1

Telephone: WELbeck 3764, 8573.

A MEDICAL & SCIENTIFIC CENTRE

FOR BOOKS, OSTEOLOGY, CHARTS,
ANATOMICAL MODELS, WALL DIAGRAMS, etc.

One minute from Euston Square (Gower Street) Station (Underground), adjoining University College and near Hospital.

H. K. LEWIS & Co. Ltd.

136 GOWER STREET, LONDON, W.C.1
(Established 1844)

MEDICAL STUDENTS, LIBRARIANS, Hospital Officers, Research Workers and Visitors from Overseas or the Provinces are invited to inspect the large selection of books, Medical and Scientific, always available.

Catalogues sent post free on request.

FOREIGN BOOKS. Books not in stock obtained to order. Titles will be quoted on request. Please state particular interest.

MEDICAL AND SCIENTIFIC LENDING LIBRARY

Annual Subscription from £1 17s. 6d. **Prospectus on Application**

Subscriptions at special rates for Undergraduates at the Medical Schools in London and the Provinces. Terms on application.

Bi-monthly List of New Books and New Editions added to the Library is issued free to all Subscribers on request. Every book in the Library is the latest edition.

THE LIBRARY CATALOGUE revised to December, 1949, containing a classified Index of Subjects and Authors. Demy 8vo. Pp. xii + 1152. To Subscribers 10s. net; to Non-Subscribers 17s. 6d. net; postage 1s. 9d. **Supplement 1950 to 1952.** To subscribers 1s. 6d. net; to non-subscribers 3s. net; postage 9d.

A New Catalogue revised to December, 1956, is in preparation.

OVER 100,000 VOLUMES ARE IN CIRCULATION AND ON THE LIBRARY SHELVES.

SECOND-HAND BOOK DEPARTMENTS.

Medical, Scientific and Technical.

Large Stock of Second-Hand Standard Works of all dates. A constantly changing stock of Medical and Scientific Literature on view, classified under subjects. Out-of-print and Early Medical Books a Speciality. Items not in Stock sought for and reported Free of Charge. Large and Small Collections bought.

H. K. LEWIS & Co. Ltd., 136 GOWER STREET, LONDON, W.C.1

Business hours: 9 a.m. to 5.30 p.m., Saturdays to 1 p.m.

Telephone: EUSton 4282 (7 lines) **Telegrams: Publicavit, Westcent, London**

postoperative sedation...

one of the many uses

for short-acting **NEMBUTAL**

In the pharmaceutical field, where rapid obsolescence is the rule rather than the exception, a product that continues to grow in popularity after nearly 25 years of use must possess distinct advantages. Consider these:—

- Short-acting NEMBUTAL (Pentobarbitone Sodium, B.P.) can produce any desired degree of cerebral depression—from mild sedation to deep hypnosis.
- The dosage required is small — only about half that of many other barbiturates.
- Hence, there's less drug to be inactivated, shorter duration of effect, wider margin of safety and little tendency towards morning-after hangover.
- In equal oral doses, no other barbiturate combines quicker, briefer, more profound effect.

NEMBUTAL

ABBOTT LABORATORIES LTD · Perivale · Greenford · Middx.

FRIEND OF THE FAMILY

WISE ADVICE about reliable methods of planned parenthood allays anxiety and inspires the mutual trust and intimate assurance necessary for lasting health and happiness in marriage.
Gynomin and Antemin are alternative types of contraceptives. Their efficient action satisfies modern requirements and both may be recommended by the medical profession.

GYNOMIN	ANTEMIN
The ideal antiseptic and deodorant contraceptive in tablet form. Simple and pleasant in use, scientifically functional in formula, and spermicidally efficient in result. Formula: Sodium Bicarbonate B.P. 12.7, Tartaric Acid 11.1 Chloramine B.P. 1.1, Perfume q.s., Excipients to 100.	A cosmetic-like antiseptic cream, with high spermicidal efficiency. Non-irritant and non-toxic. Simply applied and odourless. May be used with or without an occlusive cap. Formula: Sodium dioctyl sulphosuccinate 0.25, Ricinoleic Acid B.P. 1.00, Boric Acid B.P. 1.00, Paraformaldehyde B.P.C. 0.15, Base to 100.

The Family Planning Association advise that, for maximum safety, any chemical contraceptive should be used with a mechanical barrier.

Medical literature and samples on request

COATES & COOPER LTD.

PYRAMID WORKS · WEST DRAYTON · MIDDLESEX

Children needing aspirin will readily take

Rasprin

1¼gr. soluble aspirin tablets specially formulated* and flavoured for children

*Acid. Acetylsalicyl. B.P. gr. 1.25
Calc. Carb. B.P. . . . . gr. 0.375
Acid. Cit. B.P. (Ezsic) . gr. 0.125

RASPRIN TABLETS disintegrate in the mouth so quickly that a child cannot choke with them.

Every 10 Rasprin tablets are packed in a plastic vial, so that the maximum amount of aspirin in any one container is 12½ grains.

Rasprin is not advertised to the lay public, and may be prescribed on Form E.C.10. Basic N.H.S. price is 4d. per vial of 10 tablets—exempt from Purchase Tax.

Professional samples and literature gladly supplied on request to the manufacturers

E.G.H. LABS
PERU STREET, SALFORD, 3
LANCS

B12 *with* INTRINSIC FACTOR

for oral administration

BIOPAR FORTE is the outcome of years of ARMOUR RESEARCH to combine Vitamin B12 with a much more potent intrinsic factor than hitherto, and to provide an effective oral therapy to replace injected B12 for Pernicious Anaemia.

Each Biopar Forte Tablet contains 35 mg. Intrinsic Factor and 15 μg. Vitamin B12, equivalent to 1 U.S.P. Oral Unit. Previously untreated Pernicious Anaemia will usually give a full response to a daily dosage of one Biopar Forte Tablet for a 14-day period.

CLINICALLY EFFECTIVE in: Pernicious Anaemia and other macrocytic anaemias; Sprue; Growth Retardation; Anorexia; Polyneuritis; Diabetic and Alcoholic Neuritis; Osteoarthritis and Osteoporosis; Trigeminal Neuralgia; Migraine; Herpes Zoster.

Samples and literature will be supplied on request

BIOPAR FORTE
TABLETS

THE ARMOUR LABORATORIES
(Armour & Company Ltd.)
Hampden Park, Eastbourne, Sussex

Telephone: Hampden Park 740
Telegrams: 'Armolab' Eastbourne

In Barbiturate Poisoning and Anaesthesia

"Whatever its mode of action, there is no doubt that bemegride is a valuable advance in the treatment of barbiturate coma."
Lancet Editorial ii (1956) 980

In Barbiturate Poisoning

MEGIMIDE brand of bemegride is the safe stimulant with remarkable properties in counteracting the central nervous depression of barbiturates, and the risk of serious complication is much diminished. It is now abundantly clear from clinical evidence that MEGIMIDE is wholly effective *when used alone* in the treatment of barbiturate poisoning, and that it need not, as hitherto recommended, be used conjointly with DAPTAZOLE as an extra stimulant—this greatly simplifies the technique of treatment.

In Barbiturate Anaesthesia

After short surgical procedures with thiopentone sodium as the sole anaesthetic agent, MEGIMIDE reverses the depressant action of thiopentone on the respiratory centre and dramatically shortens post-anaesthetic sleep. It is thus valuable in post-operative nursing in a busy surgical ward, and is specially recommended for casualty, outpatient procedures and dental surgery.

MEGIMIDE
Regd. Trade Mark
BRAND OF BEMEGRIDE

A Nicholas Product

A. & G. NICHOLAS Ltd.
Ethical Pharmaceuticals,
SLOUGH, BUCKS, ENGLAND

N

'SOROSIL'
DERMAL OINTMENT

for the amelioration of itching in

- PRURITUS
- ECZEMA
- PRURIGO
- CHILBLAINS
- HAEMORRHOIDS

and other inflammatory skin conditions

H. R. NAPP LIMITED, 3 & 4, Clements Inn, London, W.C.2

the Smith & Nephew range of paste bandages

All Smith & Nephew paste bandages are made from light cotton fabric, with non-fray edges, and they are thoroughly and evenly impregnated. Each bandage is supplied in an individual moisture-proof wrapper which minimises loss of moisture by evaporation.

SMITH & NEPHEW PASTE BANDAGES ARE AVAILABLE ON E.C.10

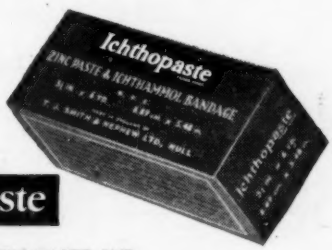
an S&N product SMITH & NEPHEW LTD · WELWYN GARDEN CITY · HERTS

Viscopaste

ZINC PASTE BANDAGES B.P.C.

Viscopaste zinc paste bandages are ready for immediate use on removal of the waterproof wrapping. They set quickly forming a thin shell. Viscopaste is indicated for eczematous conditions and also as a support for the leg following the removal of plaster of Paris casts. Viscopaste is obtainable in 6 yard lengths x 3½ ins. wide.

Ichthopaste



ZINC PASTE AND ICHTHAMMOL BANDAGES B.P.C.

These bandages contain 2 per cent ichthammol. They are indicated for eczematous conditions associated with leg ulceration, particularly when the eczema is of the weeping type. After application the paste never sets harder than its original spongy state, thus giving a resilient dressing over which an Elastocrepe or Elastoplast bandage may be applied to give firm elastic support. Ichthopaste is obtainable in 6 yard lengths x 3½ ins. wide. An improved, ready-for-use Ichthopaste bandage is available to hospitals, but it is not prescribable on Form E.C.10.

COLTAPASTE

ZINC PASTE AND COAL TAR BANDAGES B.P.C.

Coltapaste bandages are made from a light cotton fabric with non-fray edges and are thoroughly and evenly impregnated with a water miscible coal tar, zinc oxide, paste. Coltapaste is effective in the treatment of gravitational or varicose dermatitis and in the after-treatment of varicose ulceration in those cases where the skin has become dry and scaly. It is invaluable in the treatment of sub-acute dermatitis of the hands and in the treatment of occupational dermatitis. Coltapaste is obtainable in 6 yard lengths x 3½ ins. wide.

'Dettol' REGD. is active...

against both Gram-positive and Gram-negative micro-organisms.
Under standard conditions of test a dilution of 1 in 200 kills Staph. aureus in 10 minutes; a 1 in 500 dilution kills Strep. pyogenes in 10 minutes, and a 1 in 250 dilution kills Bact. coli in 10 minutes.

'Dettol'—retains a high degree of efficiency in the presence of organic matter.

'Dettol'—is not incompatible with soap, traces of which need not be removed before application.

'Dettol'—is non-poisonous and non-staining.

'Dettol'—is well tolerated by the skin and tissues.

INSTRUMENT 'DETTOL'
Instrument Dettol is widely used as a most effective and practical means of disinfecting surgical instruments—steel, stainless steel and plated, as well as glassware, rubber appliances and nylon sutures.

SURGICAL 'DETTOL'
Surgical Dettol is a specially formulated tincture for the surgical preparation of the skin. It remains actively bactericidal for a considerable period after drying. It dries quickly and leaves a non-slippery surface. Bactericidal action is not adversely affected by the use of ordinary soap solutions. Surgical Dettol in clinical use has proved non-toxic and non-irritant when used in accordance with the directions.

For leaflets giving full information on Instrument Dettol and Surgical Dettol

Please write to:
RECKITT & COLMAN LTD.,
PHARMACEUTICAL DEPARTMENT, HULL.

During winter months, your patients with chronic bronchitis can be kept up-and-about, free from distressing symptoms, by the prophylactic use of

TEDRAL

TRADE MARK

Active Principles : Theophylline 2 gr. (120 mg) Ephedrine hydrochloride ¾ gr. (25 mg) Phenobarbitone ¼ gr. (8 mg).

℞ one tablet every four hours

WILLIAM R. WARNER & CO. LTD., POWER ROAD, LONDON, W.4.

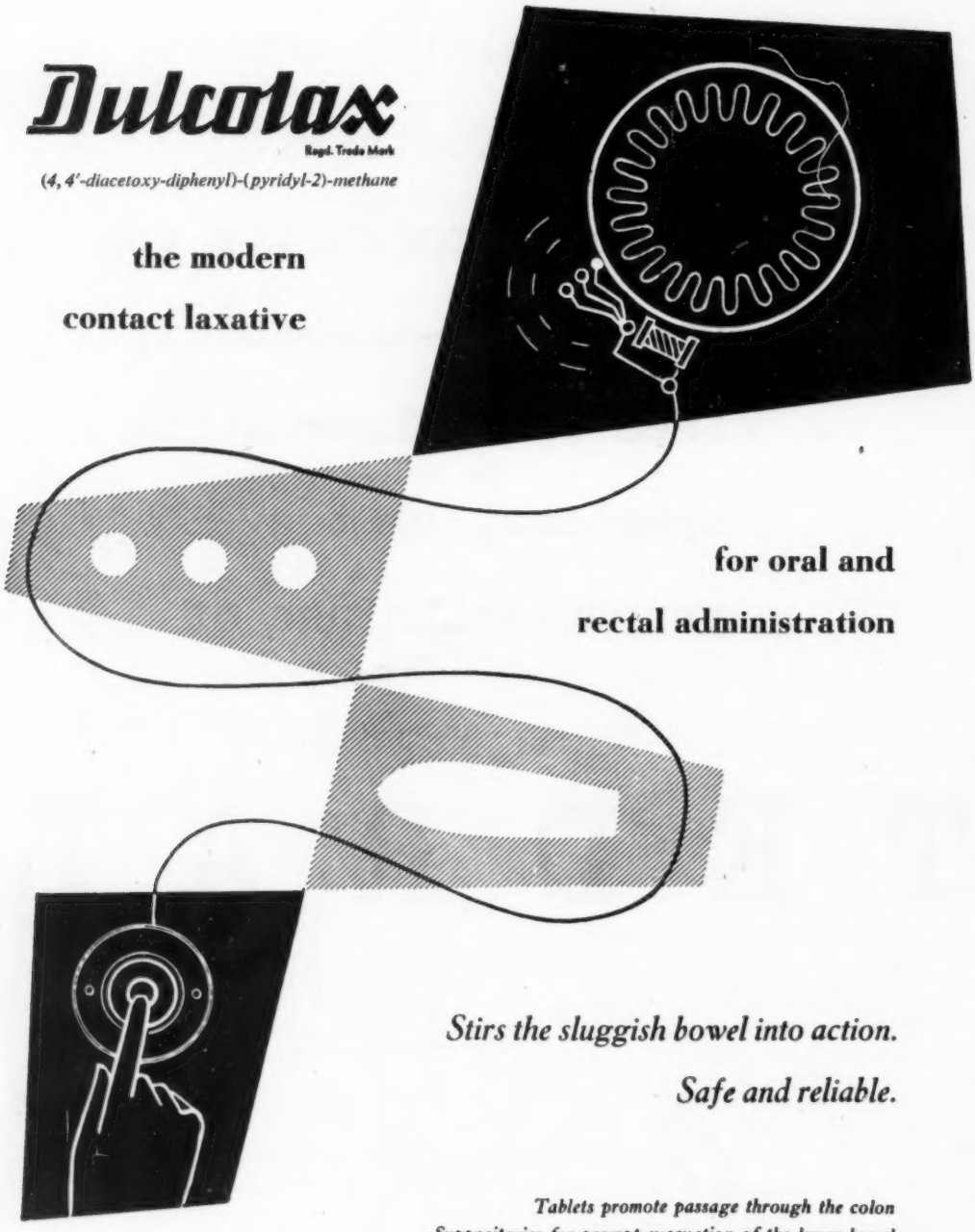
Dulcolax

Regd. Trade Mark

(4, 4'-diacetoxy-diphenyl)-(pyridyl-2)-methane

the modern

contact laxative



for oral and

rectal administration

Stirs the sluggish bowel into action.

Safe and reliable.

Tablets promote passage through the colon
Suppositories for prompt evacuation of the lower bowel

Dulcolax enteric coated tablets of 0.005 g. · Bottles of 30 and 200
Dulcolax suppositories of 0.01 g. · Boxes of 6 and 50

LEWIS LABORATORIES LTD., LEEDS 9

'A very satisfactory mixture is one of hibitane and cetavlon'

British Medical Journal 1956, *ii*, 200.

'SAVLON' LIQUID ANTISEPTIC contains 'Hibitane' and 'Cetavlon', two I.C.I. bactericides in a special formulation for safe and effective use in the home. This versatile antiseptic combines detergent properties with an unusually wide range of activity against bacteria.

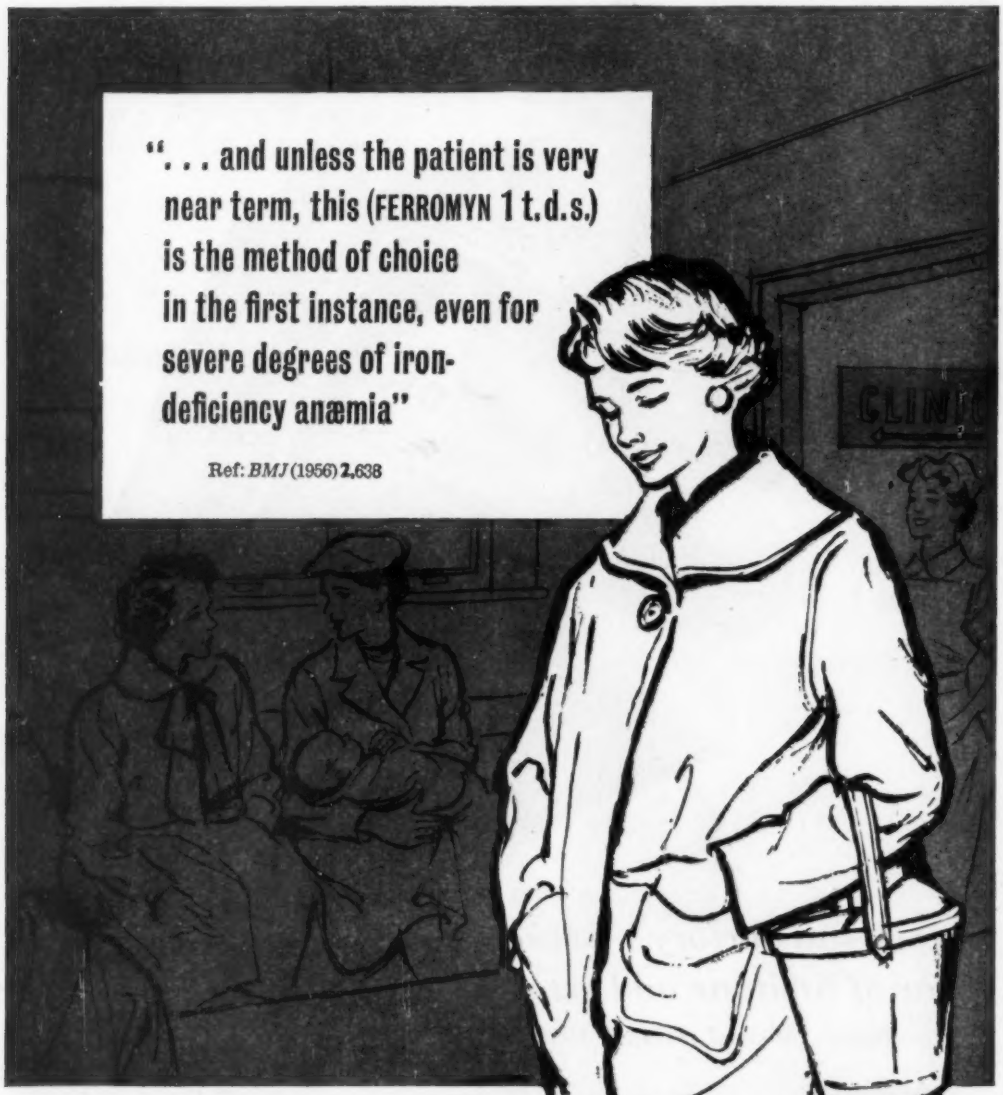
'Savlon' Liquid is now on sale to the general public, price 2/9d. a bottle from chemists.

Savlon *LIQUID* ANTISEPTIC

IMPERIAL CHEMICAL INDUSTRIES LIMITED PHARMACEUTICALS DIVISION WILMSLOW CHESHIRE

Ph.711

ICI


". . . and unless the patient is very near term, this (FERROMYN 1 t.d.s.) is the method of choice in the first instance, even for severe degrees of iron-deficiency anæmia"
Ref: BMJ (1956) 2,638
CLINIC

FERROMYN for the speedy *oral* correction of all iron-deficiency states

FERROMYN *is presented in four forms:*
FERROMYN TABLETS AND FERROMYN ELIXIR.
Each tablet/teaspoonful contains: *Ferrous Succinate 150 mg.*
FERROMYN 'B' TABLETS AND ELIXIR FERROMYN 'B'.
Each tablet/teaspoonful contains: *Ferrous Succinate 150 mg. Aneurine Hydrochloride 1 mg. Riboflavin 1 mg. Nicotinamide 10 mg.*

FERROMYN

CALMIC LIMITED, CREWE. *Phone CREWE 3251-5* **LONDON:** *2 Mansfield St., W.1. Phone LANgham 8038-9*

AUSTRALIA: 458-468 Wattle Street, Ultimo, Sydney, N.S.W. **CANADA:** Terminal Building, York St., Toronto.

Relief of Rheumatic Pain in General Practice

1. *Prompt relief by massive aspirin dosage without supervision*

It has been estimated that 8 out of 10 patients go to their doctors with some form of rheumatic complaint.

In all cases, the first aim is prompt relief, preferably calling for no supervision in administration.

An effective and safe remedy is massive aspirin dosage in the form of Berex tablets.

2. *Succinate prevents toxicity*

Clinical study* has shown that the calcium succinate in Berex prevents toxicity from massive dosage.

The prothrombin level is maintained and there is no hæmorrhagic tendency, even after prolonged dosage.

Your patients can enjoy prolonged relief, in safety, by reducing the initial dosage as soon as the pain diminishes.

Side effects — including gastric — are fewer and milder, if present at all.

3. *Encourages tissue respiration*

Experimentally, by Warburg test, it has been shown that the inhibitory action of salicylate on tissue respiration is completely offset when it is combined with succinate. Succinate encourages cellular respiration and stimulates the respiratory enzyme systems. It is to this stimulating action that the beneficial effect of succinate is attributed.

*"*No abnormal prolongation of prothrombin time even after 68 days of succinate-salicylate.*" "*The results also show that this succinate-salicylate formulation combines safety and efficacy, permitting wide use both for treatment and maintenance without the excessive supervision required in many other forms of therapy.*" Delaware State Med. J., 1954, 26, 22.

RHEUMATIC PAIN, *it is estimated, brings 8 out of 10 patients to the surgery. Prompt and prolonged relief can safely be given, in all forms of rheumatism, by administering Berex in massive and prolonged dosage. No supervision is required.*

BEREX TRADE MARK

For prompt relief of pain associated with all forms of rheumatism.

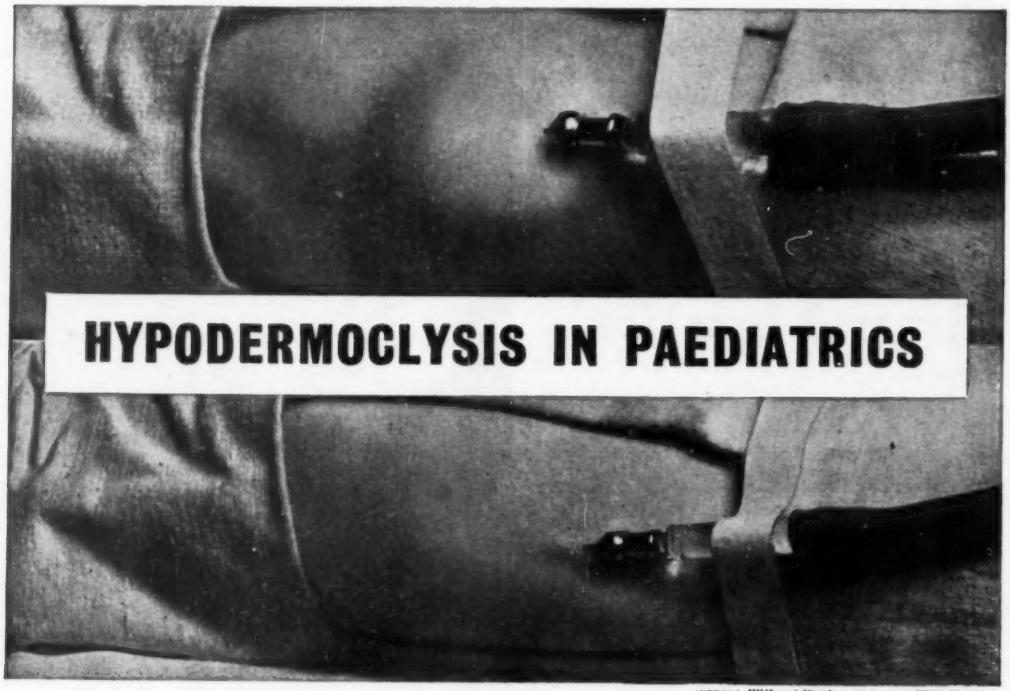
FORMULA: Calcium succinate 2·8 gr. acetylsalicylic acid 3·7 gr.

IN TABLET FORM: basic N.H.S. price 4/8½d. — 100 tablets; 24/3d. — 600 tablets.

BEREX HAS NEVER BEEN ADVERTISED TO THE PUBLIC

A professional sample will gladly be sent on request to

MEDICAL DEPARTMENT
CLINOD PHARMACEUTICALS LTD., BELVUE ROAD, NORTHOLT, GREENFORD, MIDDX.



HYPODERMOCLYSIS IN PAEDIATRICS

(UPPER) *Without Hyalase* (LOWER) *With Hyalase*

INTRAVENOUS THERAPY may often be difficult owing to the inaccessibility of suitable veins or the restlessness of the child. Subcutaneous administration must be undertaken.

A CLEAR CASE FOR 'HYALASE' the enzyme hyaluronidase. 'Hyalase' enhances the spread and absorption of fluids given by the subcutaneous route. Large volumes of solutions, such as glucose, sodium chloride, etc., can be given quickly and painlessly by this method. 'Hyalase' may be injected into the site, or injected through the tubing of the giving-set at the commencement of infusion.

FULLY DESCRIPTIVE LITERATURE, containing new and interesting uses for 'Hyalase', is available and a Technical Information Service is always at your disposal.

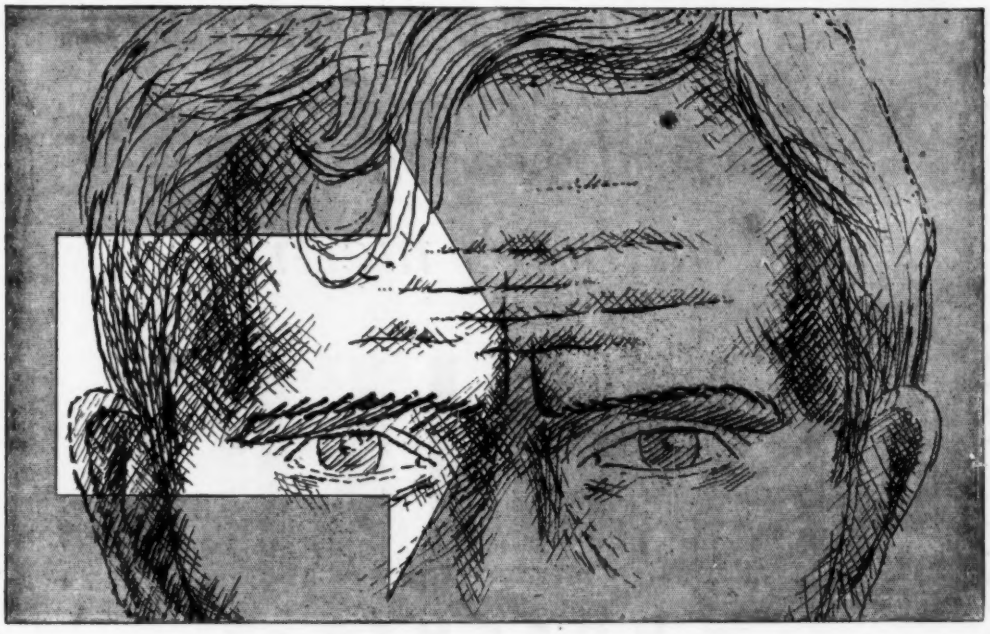
A clear case for HYALASE

TRADE MARK

BENGER LABORATORIES LIMITED · HOLMES CHAPEL · CHESHIRE

A BENGER PRODUCT

H.6



Cool-headed Therapy

It is often necessary to calm a feverish patient in addition to lowering his temperature.

Veganin is not only an antipyretic but also contains codeine phosphate to exert a sedative effect. The three ingredients of Veganin are carefully balanced to ensure maximum effect for the least dose. Under their synergistic influence, the patient is quickly soothed and his temperature safely reduced.

ACTIVE PRINCIPLES: *Acetylsalicylic acid 250 mg. Phenacetin 250 mg. Codeine phosph. 10 mg.*

DOSE: *1 or 2 tablets, 2 or 3 times a day, depending on the severity of the pain.*

PACKING: *Packs of 10, 20 and 50 tablets. Dispensing packs of 100 and 500 tablets available to chemists.*

WARNER

VEGANIN

TRADE MARK

No Warner preparation has ever been advertised to the Public

WILLIAM R. WARNER & CO. LTD., POWER ROAD, LONDON, W.4

Oral treatment of diabetes mellitus

RASTINON

» HOECHST «

(N-Butyl-N′-toluene-*p*-sulphonylurea, Tolbutamide)

CLINICAL TRIALS are already being conducted in certain hospitals in this country and the results will shortly be published.

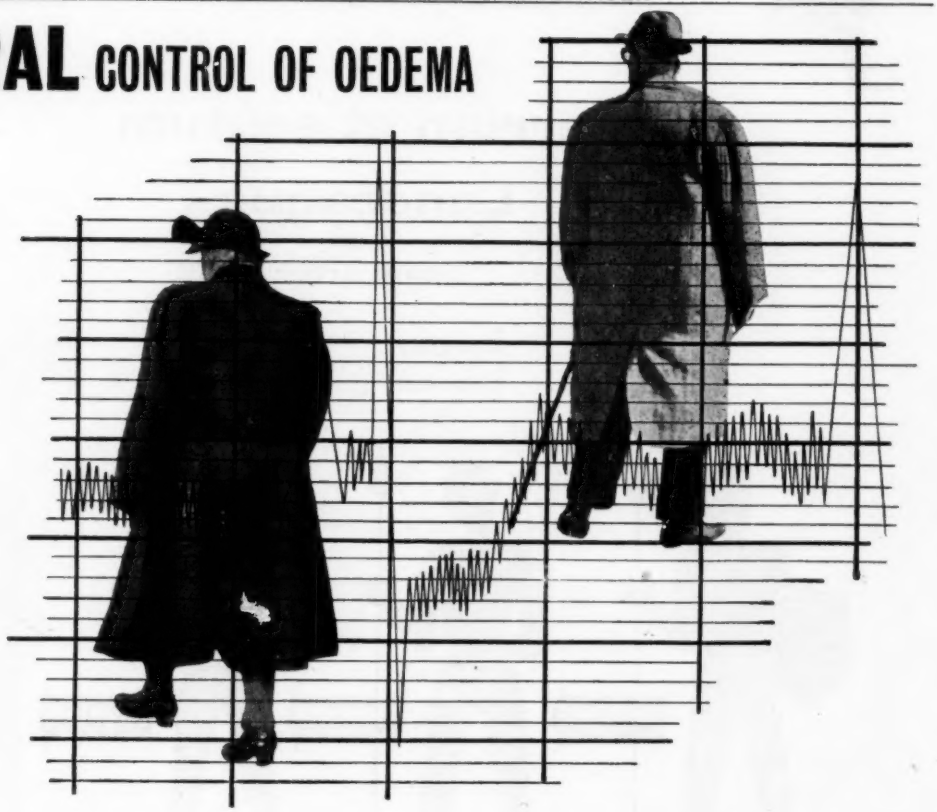
RASTINON »Hoechst« was originated in the research department of *Farbwerke Hoechst AG.*, Frankfurt (Main), under the laboratory number D 860.

In the United Kingdom supplies of Rastinon tablets, for the time being, will be restricted to Diabetic Clinics, from whom enquiries are invited.

HOECHST PHARMACEUTICALS LIMITED
SLOUGH

Distributed in Great Britain and Northern Ireland by
HORLICKS LIMITED · SLOUGH

ORAL CONTROL OF OEDEMA



Oedema in cardiac patients can now be successfully controlled by Mercloran, a mercurial diuretic which is effective when given orally. Two to three Mercloran Emplets daily maintain a smooth oedema-free state and eliminate the see-saw effect of preparations given intermittently. Mercloran in most cases completely eliminates the need for injection. However, in the acute case where it is deemed necessary to initiate treatment parenterally, the chemically related compound, Mercardan, is available.

MERCLORAN

(CHLORMERODRIN N.N.R.)

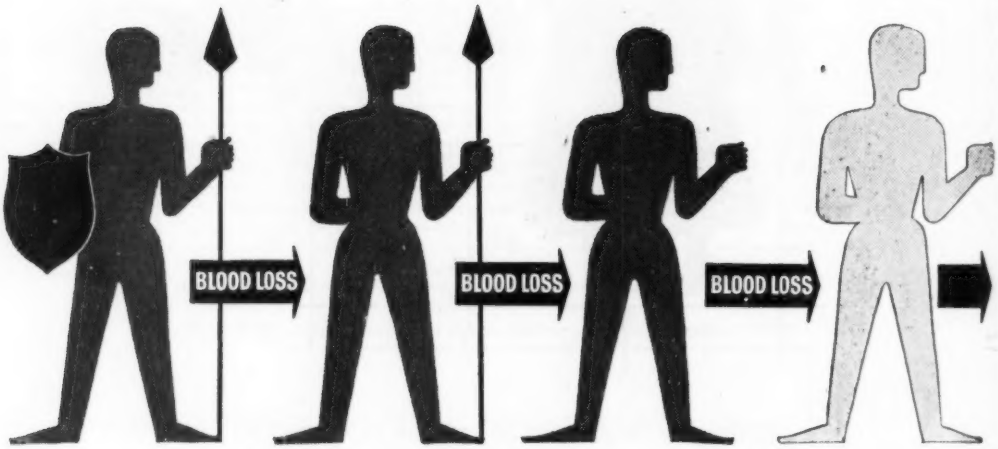
EMPLETS: (enteric coated tablets)
In bottles of 25 and 250

AND MERCARDAN FOR PARENTERAL USE

PARKE, DAVIS & Company, Limited *(Inc. U.S.A.)* **Hounslow, Middlesex · Tel. Hounslow 2361**

571

Ferrum et scutum
Lanceaque
(cum arte)



Haemoglobin normal *Body iron stores normal*	*Haemoglobin normal* *Body iron stores falling*	*Haemoglobin normal* *Body iron stores exhausted*	*Haemoglobin down* *Body iron stores still exhausted*

Suggested further reading:

Blood, 1955, **10**, 567. *Bull. N.Y. Acad. Med.*, 1954, **30**, 81.

J. Amer. med. Ass., 1956, **162**, 197. *Ann. intern. Med.*, 1955, **42**, 458.

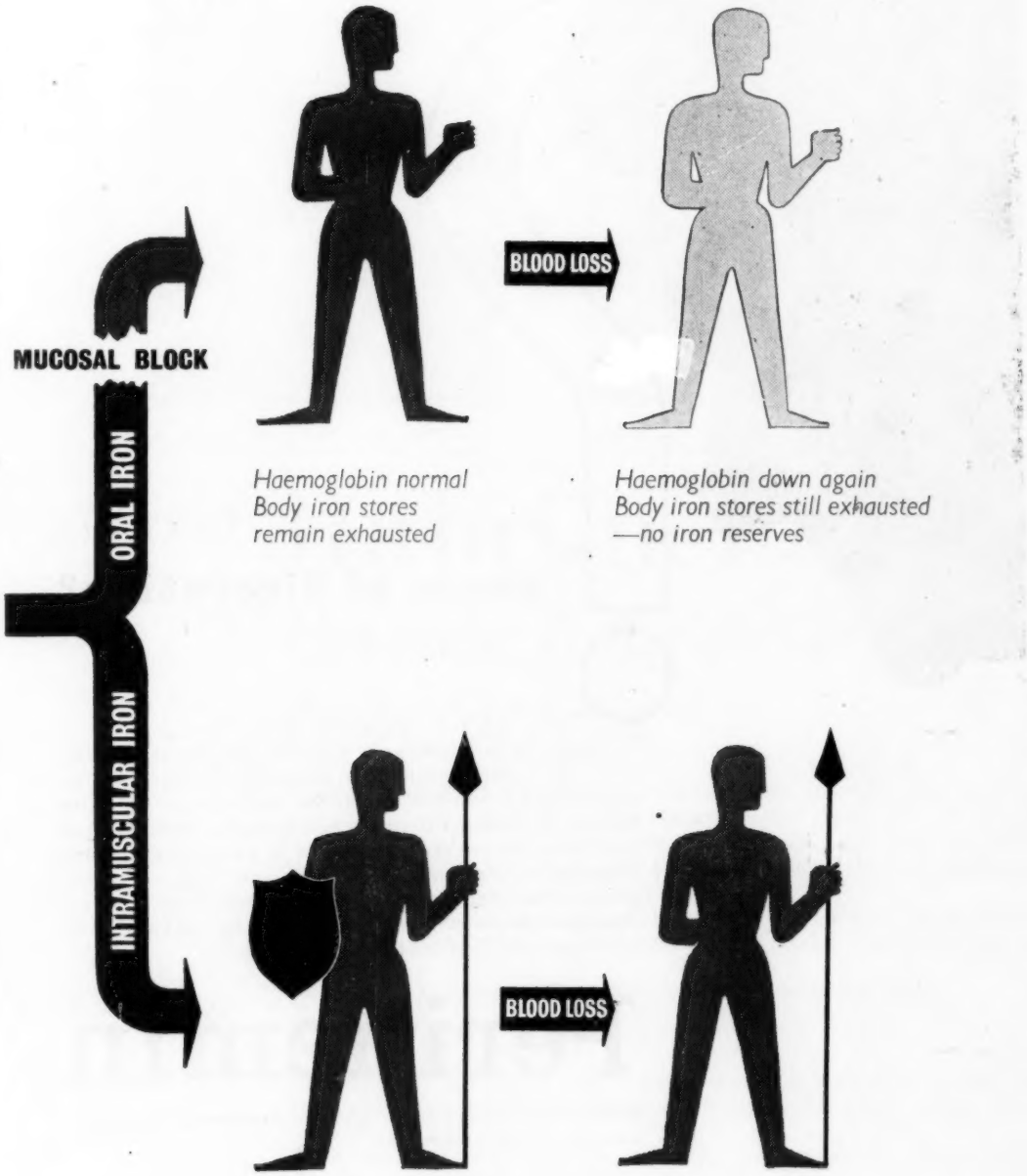
Ann. intern. Med., 1953, **38**, 199. *J. clin. Invest.*, 1952, **31**, 543.

Brit. Encycl. Med. Pract., Med. Progr., 1956, P.47.

Imferon

Iron-Dextran Complex *Trade Mark*

BENGER LABORATORIES LTD., HOLMES CHAPEL, CHESHIRE PIONEERS IN PARENTERAL THERAPY

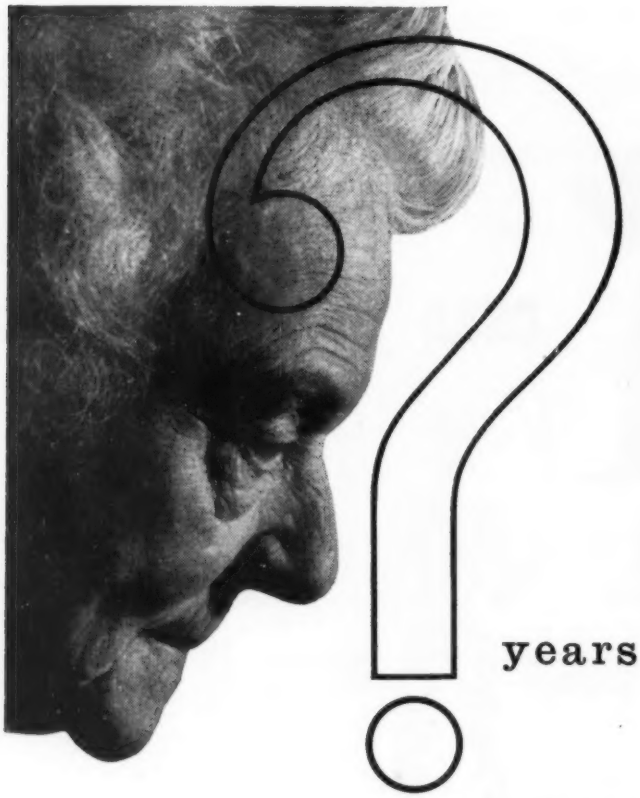


Haemoglobin normal
Body iron stores remain exhausted

Haemoglobin down again
Body iron stores still exhausted —no iron reserves

Haemoglobin back to normal
Body iron stores back to normal

Haemoglobin normal
Body iron stores falling—but still more iron reserves



years of discretion?

Wisdom may be said to grow with the years, yet dietary discretion is often sadly lacking in the elderly patient. Indifference to food is reflected in irregular, ill-chosen meals—often leading to impaired nutrition and anaemia states. For just such cases PERIHEMIN Haematinic is an eminently sound prescription. Here, in convenient capsule form, are all the principal haemopoietic substances in therapeutic amounts. PERIHEMIN is therefore valuable for closing the gaps which may exist in the body's anti-anaemia defences.

Perihemin*

Brand of Iron-B_{12}-C-folic acid — stomach-liver fraction-purified intrinsic factor concentrate. In bottles of 100 and 1000

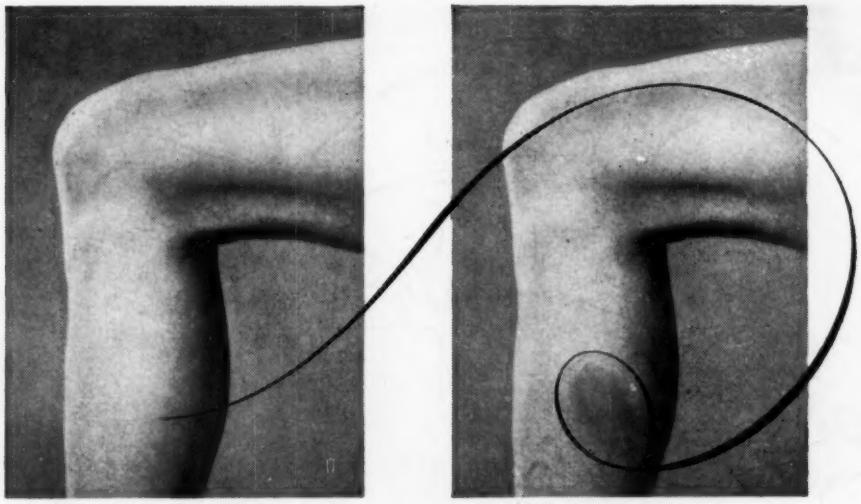
Each capsule contains ferrous sulphate exsiccated, 192 mg. FOLVITE* folic acid, 0.85 mg; vitamin B_{12}, 10 micrograms; ascorbic acid, 50 mg; powdered stomach, 200 mg; insoluble liver fraction, 50 mg; purified intrinsic factor concentrate, 0.5 mg.

*Regd. Trade Mark

Lederle

LEDERLE LABORATORIES DIVISION

Cyanamid OF GREAT BRITAIN LTD., London, W.C.2



Rubriment relieves pain in such conditions as muscular rheumatism, fibrositis, strains and sprains.

Some mirutes after application the rubefacient action is apparent and lasts for many hours.

About Rubriment

the new long-acting rubefacient

Rubriment contains a new substance—the benzyl ester of nicotinic acid—which gives a long-lasting rubefacient effect. Pharmacological experiments have shown that even after prolonged and repeated application no damage or irritation to the skin was produced. Ten minutes after applying Rubriment there is a comforting feeling of warmth which lasts for many hours.
Clinical reports have been received of the efficiency of Rubriment for the relief of pain in such conditions as muscular rheumatism, lumbago, fibrositis, strains and sprains.
Rubriment may be used to give effective relief for unbroken chilblains.

Available in two forms

Rubriment (2.5% nicotinic acid benzyl ester and 0.1% Capsicin) is available either as a cream or as a liniment, both of which are non-greasy and free from unpleasant odour.
The cream is rapidly absorbed and needs only gentle application. *It is supplied in tubes of 20 G. (approx.).* Basic price to N.H.S. 2/2d.
The liniment lends itself to massage, if this is required. It is supplied in bottles of 2 fl. ozs. (approx.). Basic price to N.H.S. 3/-.
Rubriment is not advertised to the public and can be prescribed on form E.C.10.

RUBRIMENT · Horlicks Limited
Pharmaceutical Division · Slough · Buckinghamshire

that is why

Maw's Nadecon is the preferred prescription. It permits the employment of Menthol in significant concentration and in an aqueous form.

Maw's Nadecon is indicated for the local treatment of catarrhal conditions of the upper respiratory tract. It gives immediate relief and comfort to the patient through increased ventilation with improved drainage from the infected paranasal sinuses. It establishes a pH unfavourable to bacterial development, together with conditions complementary to natural processes of recovery. When instilled into the nostrils the transient awareness of Nadecon serves to restrict excessive dosage. It is suitable for both Adult and Child patients.

Freely prescribable on EC.10 (Category 3/4)

presents
MENTHOL
in an aqueous vehicle

Maw's

Nadecon
Nasal Decongestant

FORMULA	*%W/V*
Menthol	*0.25*
Pseudoephedrine HCl	*0.99*
Chlorbutol	*0.25*
Aqueous Vehicle	*to 100*

S. Maw Son and Sons Limited · Barnet · England

G449

Children like it... worms don't

One week's treatment with 'Antepar' Elixir is usually sufficient to eradicate *threadworms*. A single dose clears *roundworms* from the gut. Effective without fasting, purging or supporting measures, 'Antepar' acts by paralysing the worms—they are then expelled by normal peristalsis.

'Antepar', the original elixir of piperazine, is well tolerated by patients of all ages. Its pleasant taste is popular with children. Containing piperazine citrate equivalent to 500 mgm. of piperazine in each fluid drachm, 'Antepar' is supplied in bottles of 4 fl. oz. and 20 fl. oz.

'ANTEPAR' BRAND ELIXIR

BURROUGHS WELLCOME & CO. (THE WELLCOME FOUNDATION LTD.) LONDON

Associated Houses:
AUCKLAND BOMBAY BUENOS AIRES CAIRO DUBLIN JOHANNESBURG KARACHI MONTREAL NAIROBI NEW YORK RIO DE JANEIRO ROME SYDNEY

Almost the worst thing about 'flu is getting over it

To the mentally depressed and bodily fatigued post-influenzal patient, METATONE* brings a quick return to normal vigour. Combining appetite-promoting vitamin B with mineral glycerophosphates and strychnine, Metatone has an outstanding capacity for speedily restoring normal metabolic function.

METATONE

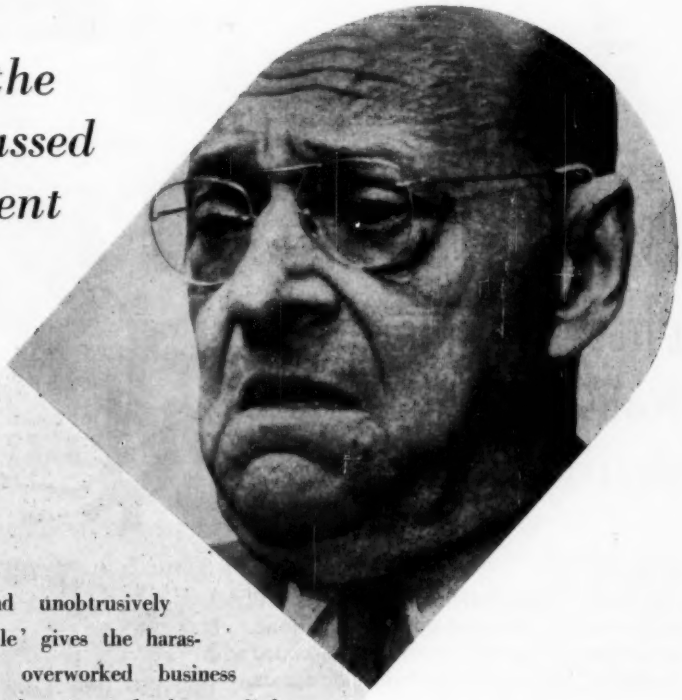
* *Trade Mark*

speeds recovery

PARKE, DAVIS & COMPANY LTD. (Inc. U.S.A.) HOUNSLOW · MIDDLESEX · Telephone: Hounslow 2361

164

for the harassed patient



Smoothly and unobtrusively 'Drinamyl Spansule' gives the harassed housewife, the overworked business man or the menopausal woman day-long relief from tension—with just one oral dose. 'Drinamyl Spansule' does not tempt the patient to establish the melancholy t.i.d. or q.d. habit of taking 'another pill to keep me going'. Harassment and worry are replaced by a day-long mood of calm composure.

'*Drinamyl Spansule*' sustained release capsules *Strength No. 1:* each capsule contains 10 mg. 'Dexedrine' (dextro-amphetamine sulphate) and 64 mg. (gr. 1) amylobarbitone. *Strength No. 2:* each capsule contains 15 mg. 'Dexedrine' (dextro-amphetamine sulphate) and 97 mg. (gr. 1½) amylobarbitone.

Both strengths in containers of 30 capsules

Drinamyl Spansule

Smith Kline & French

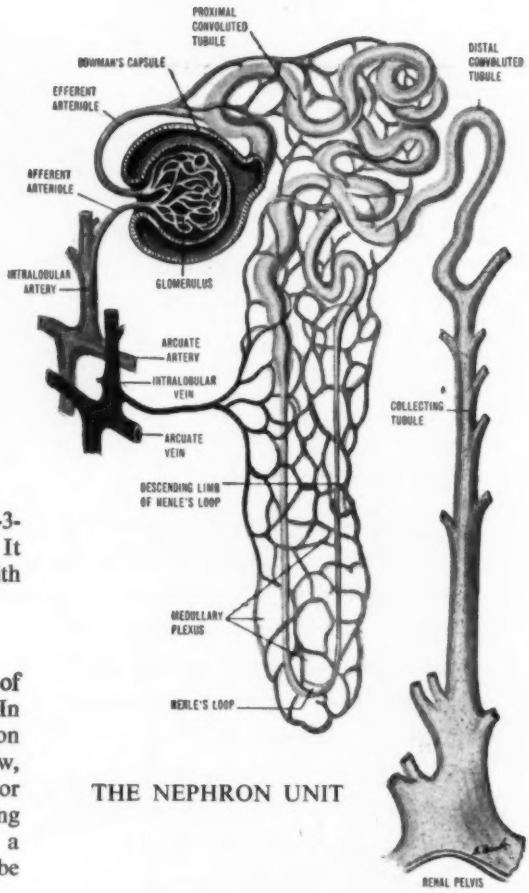
represented by Menley & James, Limited, Coldharbour Lane, London S.E.5

SUDLP66

A PRODUCT OF SEARLE RESEARCH

MICTINE*

Effective, Non-Mercurial Oral Diuretic



THE NEPHRON UNIT

STRUCTURE

"Mictine," brand of aminometradine, is 1-allyl-3-ethyl-6-aminotetrahydropyrimidinedione. It avoids the undesirable side-effects associated with mercurial, xanthine or sulphonamide agents.

ACTION AND EFFECTIVENESS

"Mictine" is believed to act by inhibition of sodium ion absorption in the renal tubule. In therapeutic dosage it has not caused any effect on glomerular filtration rate, renal plasma flow, cardiac output, heart rate or blood pressure, nor any alteration in the blood or blood-forming tissues or in renal or hepatic function. In a group of unselected patients 70 per cent. may be expected to respond to "Mictine".

TOLERANCE

"Mictine" is not toxic at therapeutic dosages. On the other hand, side-effects do occur such as headache and gastro-intestinal symptoms. These are reduced to a minimum if an interrupted dosage scheme is adopted.

ADMINISTRATION

"Mictine" is indicated in the maintenance of an oedema-free state in any patient requiring diuretic therapy and the effecting of initial diuresis in all patients but those with severe congestive failure. For these purposes the dosage is one to four tablets daily in divided doses *during meals* on alternate days or on three successive days followed by four days without therapy. "Mictine" is not intended to produce initial diuresis in more severe congestive failure; however, "Mictine" may be given when other diuretics are contra-indicated, or if tolerance to them has developed.

Available in bottles of 25, 100 and 500 tablets each containing 200 mg. aminometradine.

Full literature is available to the medical profession on request. G. D. Searle & Co. Ltd., High Wycombe, Bucks. Tel. High Wycombe 1770.

**Registered Trade Mark*

SEARLE

MI : P86

EVANS MEDICAL

COLLIRON

One of a complete range of

Iron Preparations

Many oral iron preparations cause gastro-intestinal irritation thereby making it impossible to administer sufficient iron by the oral route to restore the hæmoglobin level to normal. Colloidal ferric hydroxide in the form of COLLIRON overcomes this great disadvantage, as the iron is presented in a non-irritant form and is readily tolerated even in large dosage over a prolonged period.

OUTSTANDING ADVANTAGES OF COLLIRON

1. *Pleasant to take*
2. *Well tolerated*
3. *Efficient utilization*
4. *Does not stain the teeth*
5. *Particularly suitable for children to whom it can easily be administered by means of a special dropper bottle.*

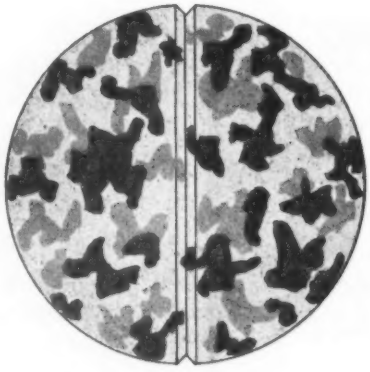
Presentation

Bottles of 4 fl. oz. and 8 fl. oz.
Dropper bottles of 30 ml.
COLLIRON is also available in capsules
If rapid response to iron therapy is needed
COLLIRON I.V. is unexcelled.

COLLIRON

Further information on request from : **EVANS MEDICAL SUPPLIES LIMITED,**
Speke, Liverpool 19, and Ruislip, Middlesex

Belladenal



retard

sustained-action tablets

(Each tablet contains : 0.25 mg. total alkaloids of belladonna and 50 mg. phenobarbitone)

Gradual liberation of the active principles provides sustained action for about 10 hours

One tablet morning and evening ensures round-the-clock action

Samples will be gladly supplied upon request

SANDOZ

SANDOZ PRODUCTS LIMITED, 134 WIGMORE STREET, LONDON, W.1

Pollaccine for Hay-Fever Prophylaxis

Prophylaxis against hay-fever may be successfully accomplished by hyposensitisation with POLLACCINE,* an extract prepared from the pollens of timothy grass and cocksfoot, and considered to be polyvalent for all true hay-fever. To allow completion of the course before the hay-fever season in May, POLLACCINE injections should begin in January or February. Modified courses are available for 2nd and 3rd year patients.

POLLACCINE may be prescribed under the National Health Service; For details of packaging, please see Parke-Davis Catalogue.

* *Trade Mark*

An Addition to the range of Diphtheria Prophylactics

Diphtheria Prophylactic, Formol Toxoid (FT)

For primary immunization against diphtheria, or for boosting purposes at school entry age, Formol Toxoid is available in

Ampoules of 0.5 ml.
Sets of 3 x 0.5 ml. ampoules.
Vials of 10 ml.

Pollaccine and Diphtheria Prophylactic Formol Toxoid are prepared in the Wright-Fleming Institute of Microbiology, St. Mary's Hospital Medical School, London, W.2.

Sole Agents:

PARKE, DAVIS & CO., LTD., Staines Road, Hounslow, Middlesex.

Telephone: Hounslow 2361.

393

CHEMOTHERAPY OF TUBERCULOSIS

Calcium B-PAS

WANDER

the newest proven modification of PAS for safe, acceptable, convenient and therapeutically reliable performance in combined regimens with Isoniazid.

B-PAS (Wander), 4-benzoylamino-2-hydroxybenzoate, first introduced by our Research Laboratories in 1948, is an acknowledged contribution to tuberculotherapy.

ADVANTAGES

CALCIUM B-PAS (Wander) is virtually insoluble.
It provides high blood levels of extended duration.
It is practically tasteless.
It is well tolerated and best suited for domiciliary use.

MULTIPLE PRESENTATION FOR COMBINED REGIMENS

CALCIUM B-PAS (Wander) is available as such in two convenient forms: Powder and Cachets. Content in each form is ranged so that the daily regimen is simplified. The 3.5 g. Powders taken with a draught of water or milk are especially acceptable. For combined regimens of B-PAS and INAH, 'B-PASINAH' Powders and Cachets according to preference supply the advantage of concurrent therapy in readily acceptable form which practically ensures the patient's co-operation in carrying out instructions.

PACKINGS

CALCIUM B-PAS WANDER

Powders: Tins of 150 and 500 x 3.5 g. envelopes
Cachets: „ „ 80 and 400 x 1.0 g.
Sodium B-PAS (Wander) also available in 1.5 g. Cachets

'B-PASINAH' (B-PAS plus Isoniazid)

Powders: Calcium B-PAS (Wander) 3.5 g.
Isoniazid ... ... 87.5 mg.
Tins of 150 and 500

Cachets: Calcium B-PAS (Wander) 1 g.
Isoniazid ... ... 25 mg.
Tins of 100 and 500

Full Abstracts from Literature on B-PAS, also details of institutional quantities and prices sent on request.

'PASINAH' Cachets of 1.5 g. Sodium PAS and 17, 25, 33 or 50 mg. Isoniazid also available.
Tins of 100 and 500

All Wander tuberculostatic products are obtainable from usual pharmacists or direct from

A. WANDER LIMITED

42 Upper Grosvenor Street, Grosvenor Square, London W.1

CANADA: A. Wander Ltd., Peterborough, Ontario. AUSTRALIA: A. Wander Ltd., Devonport, Tasmania. NEW ZEALAND: A. Wander Ltd., Christchurch. INDIA: Khatau Valabhdas & Co., Indian Globe Chambers, Fort Street, Fort, Bombay, 1. PAKISTAN: Grahams Trading Co. (Pakistan) Ltd., P.O. Box. 30, Karachi. CEYLON: A Baur & Co. Ltd., Colombo.

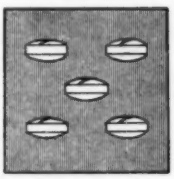
M 399

Piriton

the safe, low dosage antihistamine

FOR EXPECTORANT COUGH THERAPY

PIRIEX, a combination of an antihistamine of low toxicity with accepted expectorant drugs, effectively liquefies tenacious sputum and aids its prompt removal. Piriex is suitable for administration to children and adults.



FOR ROUTINE ANTIHISTAMINIC THERAPY

PIRITON TABLETS containing 4 mg. of Piriton maleate, an improved antihistamine, provide distinct symptomatic relief of allergic symptoms in hay fever, vasomotor rhinitis, urticaria, angio-neurotic œdema, insect bites, etc.

FOR PARENTERAL ANTIHISTAMINIC THERAPY

PIRITON INJECTION, containing 10 mg. of Piriton maleate per c.c is indicated for the prevention and treatment of reactions due to penicillin, other parenteral medications and blood transfusions.

FOR PÆDIATRIC ANTIHISTAMINIC THERAPY

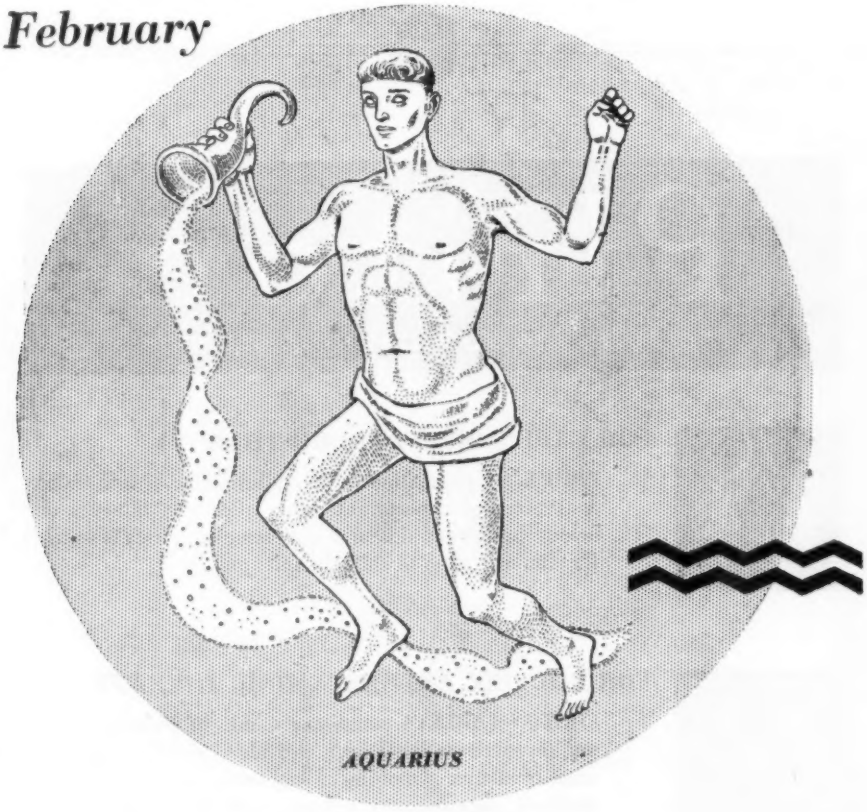
PIRITON SYRUP is the ideal form of administration for antihistaminic therapy to children of all ages. It is compatible with many drugs and its use as a base is often advisable when it is desired to administer medications to which the patient is known to be allergic.

C56/626/H

ALLEN & HANBURYS LTD LONDON E 2

TELEPHONE: BISHOPSGATE 3201 (20 LINES). TELEGRAMS: "GREENBURYS, BETH, LONDON"

February



at this time of the year . . .

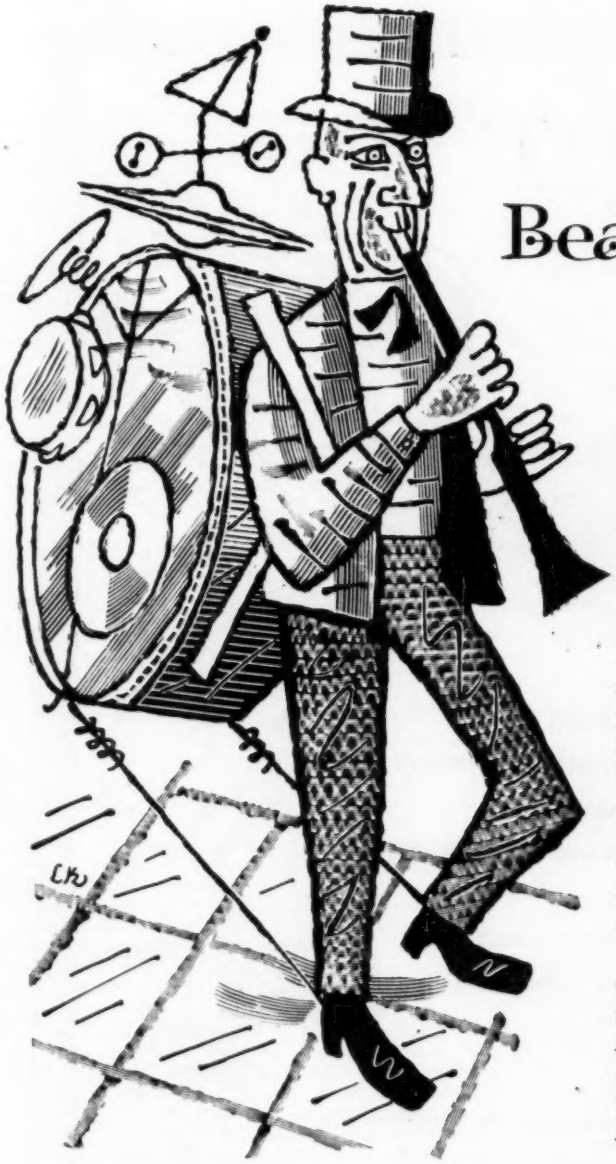
The increase in upper respiratory tract infection
calls for the discriminating use of
a safe and efficient nasal decongestant

IN A WORD . . . **Fenox** *NASAL DROPS*

Isotonic Nasal Drops
of Phenylephrine and Naphazoline.
Basic N.H.S. price 1/8 per ½ fl. oz. dropper bottle

BOOTS PURE DRUG COMPANY LIMITED · NOTTINGHAM · ENGLAND

Boots



Beats the lot

'CORTISPORIN' kills the bacteria of surface infections

This new ointment contains bacitracin, neomycin and polymyxin B sulphate. It has a wider range of activity than any single antibiotic, destroying gram-positive and gram-negative organisms, including *Ps. pyocyanea, proteus* and staphylococci. Bacterial resistance or skin sensitisation are unlikely with 'Cortisporin'; nor does it induce cross-resistance or cross-sensitisation to penicillin or other antibiotics. It often succeeds where other antibiotics fail.

'Cortisporin', by virtue of its other constituent, hydrocortisone, also reduces inflammation.

*For further information please apply to BURROUGHS WELLCOME & CO., The Wellcome Building, Euston Road, London, N.W.*1.

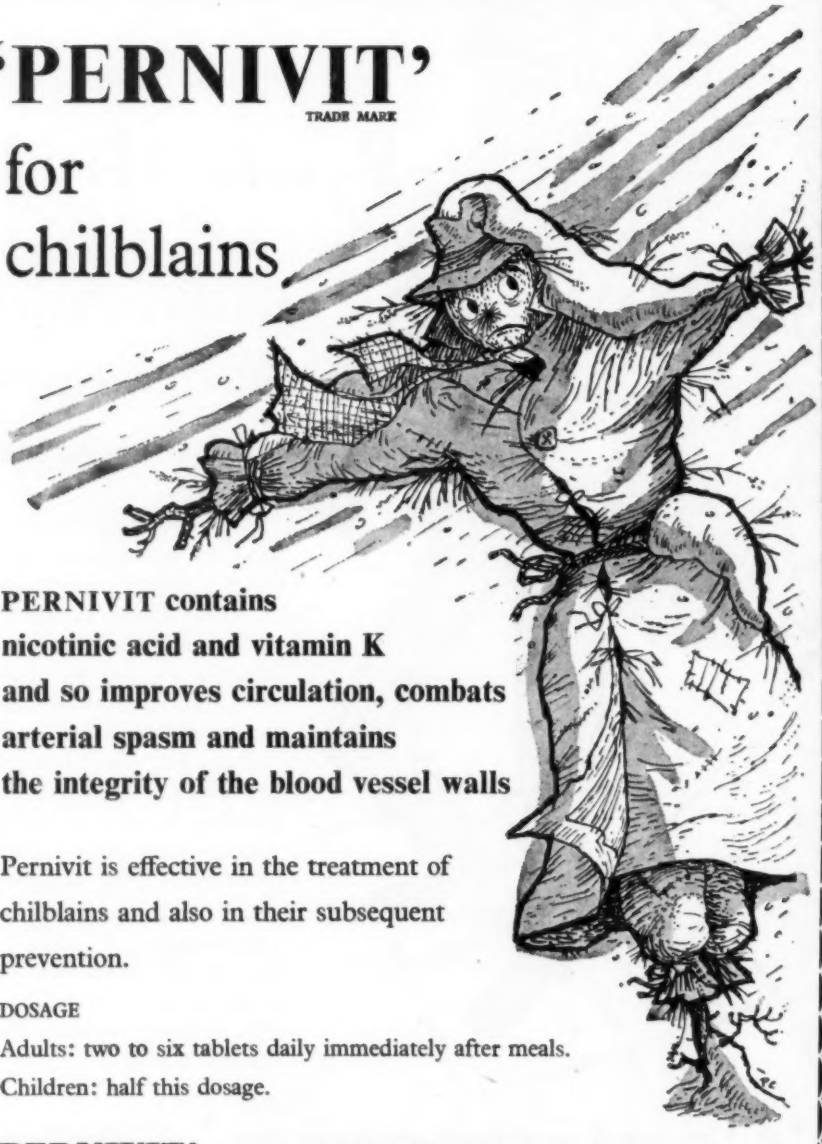
'Cortisporin' BRAND OINTMENT

Issued in collapsible tubes of 10 gm. with nozzle for economical use.

BURROUGHS WELLCOME & CO. *(The Wellcome Foundation Ltd.)* LONDON

'PERNIVIT'
TRADE MARK

for chilblains



PERNIVIT contains nicotinic acid and vitamin K and so improves circulation, combats arterial spasm and maintains the integrity of the blood vessel walls

Pernivit is effective in the treatment of chilblains and also in their subsequent prevention.

DOSAGE

Adults: two to six tablets daily immediately after meals.

Children: half this dosage.

'PERNIVIT' TRADE MARK Tablets, basic **N.H.S.** price 2/- bottle of 50.

Literature and specimen packings are available on request.

THE BRITISH DRUG HOUSES LTD. (Medical Department) LONDON N.I

CHEMICAL CARCINOGENS AND THEIR SIGNIFICANCE *

J. W. COOK
D.Sc., Ph.D. Lond., F.R.S., F.R.I.C.
VICE-CHANCELLOR OF THE UNIVERSITY OF EXETER

THE success achieved by chemotherapy against parasitic organisms gives grounds for hope that chemotherapeutic agents against cancer may eventually be found. Hitherto the search has been largely empirical; but, if distinctive differences between normal and malignant tissue were found, the way would be open for a more rational approach. Some promising results have recently been reported with modified amino-acids and purines, such as 6-azauracil and 6-mercaptopurine riboside. Such substances might be expected to act by displacing some normal components in the synthesis of nucleoproteins.

I have been concerned with chemical carcinogens for the past twenty-five years, during which time our knowledge of this subject has increased so extensively that I can do no more than touch on some selected aspects.

Historical

Sir Ernest Kennaway first showed, in 1930, that cancer could be produced by a pure chemical compound; but this discovery had its origin in observations made by Percivall Pott in the latter part of the eighteenth century. Pott described chimney-sweep's cancer, which he clearly recognised as an industrial disease and attributed to some peculiar quality of the soot to which the sweeps were exposed. This view was vindicated by Passey in 1922, when he showed that skin cancer could be produced in mice by painting them with an ethereal extract of soot. The first such experimental production of cancer had been accomplished in 1915 by Yamagiwa, who applied coal tar to the ears of rabbits, and the same agent was shown a few years later by Tsutsui to cause skin tumours in mice. This procedure of application to the skin of mice has been used extensively ever since in testing for carcinogenic action.

During the 1920s and earlier, other examples of industrial skin cancer became recognised. Coal-tar workers were found to be liable to the disease, as also were workers in the Scottish shale-oil industry, especially those engaged in handling the paraffin scale. A similar liability was found in workers in the Lancashire cotton industry and traced to the action of mineral lubricating oil to which the mule spinners were exposed. The question was, therefore, what particular constituents of these materials were responsible for these effects. Coal tar, lubricating oil, and shale oil are all complex mixtures, and it became a matter of importance to determine which of their components had these pathological effects. The problem was taken up by Kennaway, who tested many of the known constituents of coal tar without result but was able to prepare new forms of carcinogenic tars, the study of which provided valuable clues, especially those arising from the spectroscopic work of Mayneord and Hieger. I joined the team at the Cancer Hospital in London in 1929, so that chemical methods could be brought to bear on the problem, and was assisted in these by another young chemist, Hewett.

Carcinogenic Hydrocarbons

The efforts of our small team were rapidly crowned with success, and in a relatively short time we had synthesised a considerable range of pure chemical compounds with cancer-producing activity, some of them remarkably potent. For the most part these were new compounds, prepared for the first time in connection with these studies, and they belong to the class of polycyclic aromatic hydrocarbons. The parent compound of the first group of such hydrocarbons found to have this biological action is 1:2-benzanthracene. Although in itself it has little or no activity, active compounds arise when substituents are introduced into suitable positions in the molecule. By preparing and testing large numbers of compounds we were able to make some rough generalisations about the conditions necessary for carcinogenic activity within this group.

Fluorescence spectroscopy of carcinogenic tars provided the clue which led to the discovery of these cancer-producing hydrocarbons. They have a fluorescence spectrum similar to that characteristic of the tars. The same clue was used by Hieger in the systematic fractionation of coal-tar pitch, which led eventually to the isolation of a very potent carcinogenic hydrocarbon, hitherto unknown, which was shown to be 3:4-benzpyrene. This we also synthesised, and the synthetic material was just as active as that isolated from coal-tar pitch. This hydrocarbon is related in molecular structure to 1:2-benzanthracene. It is a fair presumption that 3:4-benzpyrene is responsible, at least in part, for the skin cancer in coal-tar workers. Direct proof of this would naturally be difficult to secure.

Whether mineral oils have this or similar carcinogenic constituents is still an open question. The matter is being investigated under the auspices of the Medical Research Council. Chemical separation of pure components of the active fractions of a Kuwait oil is being undertaken by Dr. W. Carruthers and Mr. A. G. Douglas. They have already, in Glasgow, isolated and identified a considerable number of new constituents of the oil, and this work is now being continued in Exeter, in the laboratory of the new M.R.C. Carcinogenic Substances Research Group at the university.

The carcinogenic hydrocarbons have very interesting biological properties. Applied to the skin of laboratory animals they cause first papillomas and then malignant tumours which have all the usually accepted criteria of carcinomas. They show invasion of muscle and they give rise to secondary tumours, usually in the lungs or the axillary glands. If the same compounds are applied by subcutaneous injection they cause sarcomas which can be grafted and maintained in successive hosts, apparently indefinitely. In fact, with these compounds, cancerous tumours have been obtained in a great variety of tissues and in a number of different species of animal (e.g., rats, mice, rabbits, hamsters, guineapigs, and fowls). The tumours also show great variety morphologically, and their nature seems to be determined mainly by the character of the cells in the tissues affected by the carcinogenic agent.

Differences between the substances are quantitative rather than qualitative. Thus, two compounds may vary in the rates at which their application to a given tissue leads to tumour formation, and the relative potencies determined in this way will not necessarily be the same if a different tissue is used as test object. To put this last statement in another way, a compound A may give epitheliomas in mice twice as rapidly as a compound B, but in the production of sarcomas in fowls or epitheliomas in rabbits B may prove to give a response three times as rapidly as A.

The certainty with which malignant tumours are produced—e.g., by painting on mice—with the more potent compounds is very impressive, as also is the smallness of the dose, amounting in the case of the more active compounds to microgramme quantities, with which tumours have been produced. If chemical compounds are concerned in the initiation of human cancer

* Abridged from a lecture given to the Devon and Exeter Medico-Chirurgical Society on Oct. 18, 1956.

in general, as may well be the case, it is important to recognise that we may be dealing with either small amounts of highly active compounds, perhaps acting for a relatively short time, or larger amounts of weakly carcinogenic compounds acting over many years, perhaps the major portion of the normal life-span.

The intensive research on carcinogenic substances which has been undertaken during the past quarter of a century has complicated rather than simplified the problem. Many active compounds are known, not only among the various groups of polycyclic hydrocarbons but also with analogous compounds in which one or more of the aromatic rings has either nitrogen or sulphur as part of its make-up. There are also carcinogenic compounds of widely different chemical types in which no common feature can be recognised. These include azo dyes and aromatic amines, both of which groups merit comment.

A characteristic of the carcinogenic hydrocarbons is that they act locally, at the site of direct application. Injection into the subcutaneous tissue gives spindle-cell sarcomas of connective tissue; application to the skin gives squamous-cell epitheliomas; tumours have been obtained by direct application to other tissues—e.g., liver, spleen, and brain—and insertion of pellets in the femur and tibia has given osteosarcomas and fibrosarcomas.

Azo Dyes

The azo dyes, of which the carcinogenic action was first reported by Yoshida and Kinosita, give, on the other hand, only tumours of the liver (hepatoma and cholangioma), irrespective of the route of administration. Metabolic studies support the view that the action of the carcinogenic hydrocarbons is a direct action on the cells, but in the case of the azo dyes the action is probably indirect, resulting from the conversion of the dye in the liver into a carcinogenic metabolic product, which may be an aromatic amine. A compound of the latter class, β-naphthylamine, has been shown to cause bladder cancer in dogs and is probably responsible for the high incidence of cancer of the bladder found among workers in dyestuffs. The evidence incriminating β-naphthylamine in this is so strong that the manufacture of this important dyestuffs intermediate has been abandoned in the United Kingdom.

The action of azo dyes in producing liver tumours is also of practical importance inasmuch as compounds of this class have been used for colouring food. Dietary deficiency, particularly of protein and riboflavine, seems to be a factor in influencing the production of liver tumours, for which massive doses of the dye are required. But the possible carcinogenic effects of these dyes has led a Government committee to recommend that only a restricted list of dyes should be used for colouring food.

Other types of compounds which have been shown to be carcinogenic are certain epoxides, such as the diepoxide of vinylcyclohexene, some ethyleneimines, and the so-called nitrogen mustards. These three groups are all highly reactive chemically, in contrast to the polycyclic hydrocarbons, and they act as cytotoxic agents. They appear to act directly on the chromosome mechanism of the cells and, in doing so, bring about effects indistinguishable from those of X rays, which also have a carcinogenic action.

In spite of much research we still do not know anything of the mechanism by which the polycyclic hydrocarbons transform normal cells into cancer cells, but it may be associated with the fact that at least one of them is known to become firmly attached to skin proteins. In a similar way the azo dye butter-yellow has been shown to form a complex with liver proteins, and this is formed more slowly in rats given a protective diet containing added riboflavine. These and other findings have suggested that the induction of malignant change is attributable to the gradual deletion of key proteins essential for the control of growth. Among the experimental observations which require explanation are the findings that the production of tumour by carcinogenic hydrocarbons can be considerably accelerated by co-carcinogens (e.g., croton oil) and retarded by other agents (e.g., mustard oil).

Tobacco and Lung Cancer

Cancer of the lung has increased at least tenfold during the past thirty years and is well on the way to becoming the most common form of cancer in men. Lung cancer has not increased in women to anything like this extent. In 1954, for example, in England and Wales, six men died from cancer of the lung for every woman. There is now an impressive amount of statistical evidence which seems to incriminate cigarette-smoking in the increase of lung cancer, but this is clearly not the only factor. In England and Wales in 1950 there were 15,000 deaths attributed to cancer of the lung, and in 1955 the figure had risen to 17,270. A fifth of the victims were non-smokers, and in these also cancer of the lung is increasing. But the statistical data undoubtedly suggest a much enhanced liability to lung cancer among cigarette-smokers and to a lesser extent among smokers of pipes and cigars.

If smoking is the cause of this increase of lung cancer, presumably there are carcinogens in the smoke. The tarry condensates of the smoke obtained by smoking cigarettes in machines designed to reproduce the conditions of human smoking have indeed been shown to contain small amounts of polycyclic hydrocarbons, among them 3:4-benzpyrene. But the amount is exceedingly small, and there is considerable doubt about whether the concentration is high enough to produce carcinogenic action. Wynder, in the United States, has obtained malignant tumours of the skin in mice by the application of tobacco tar prepared in this way, but other workers have obtained purely negative results, and it is possible that, in the preparation of his tar, Wynder had used more drastic conditions, especially as regards temperature of combustion, than we have in normal smoking. This question of whether there are harmful amounts of carcinogen in tobacco smoke, and, if so, what is the nature of the carcinogen, is one of the two problems to be investigated in the new carcinogenic substances group of the Medical Research Council in Exeter. A major difficulty is that we have not yet a satisfactory method of biological test. The lung tumours which have been induced in animals with chemical carcinogens are usually adenomas, and tumours analogous to the bronchocarcinoma of man have not so far been induced experimentally in animals.

Atmospheric Pollution

The other main factor which may be concerned in the increase of lung cancer is atmospheric pollution associated with urbanisation and industrialisation. Town air is at times heavily contaminated with soot, which is known to contain occluded 3:4-benzpyrene, and this soot is deposited in the lungs of town dwellers. Also, experiments have shown that 3:4-benzpyrene may be present in the exhausts of petrol engines and diesel engines under conditions of inefficient running, and there is reason to think that other carcinogens may be present in the fumes from petrol engines.

It may well be that a summation effect is operative, and that the combined effect of soot, engine fumes, and tobacco smoke will produce sufficient concentration of carcinogen to give lung tumours under conditions where none of these alone would be effective. A plausible suggestion is that the solvent action of the constituents of tobacco smoke may extract the benzpyrene absorbed in the soot deposited in the lungs with the result that this

carcinogen is brought into intimate contact with the tissues. Kotin, of Los Angeles, who discussed cancer-morbidity data for different countries and different regions, concluded that the main factors influencing the incidence of lung cancer are environmental and associated with the degree of atmospheric pollution, and that tobacco-smoking plays a subsidiary rôle. Conclusive evidence of the importance, both relative and absolute, of these various factors is going to be very difficult to secure. In the meantime the best advice that can be given, especially to young people, is that it would be well to avoid the large cities, particularly in industrial areas, and to give up smoking.

Cholesterol

I began by recording facts; I have moved into the realm of conjecture; and I am going to finish by becoming frankly speculative. What about cancer of the internal organs of man? Is this due to the action of carcinogenic substances? I can answer this question only in a negative way; there is no evidence to show that it is not. In a malignant tumour induced by a polycyclic hydrocarbon there is no longer present the substance which initiated it, and the fact that such carcinogens cannot be detected in spontaneous tumours is no proof that they were not concerned in the origin of the tumours. Although the known powerful carcinogens have not been detected in tissues or body-fluids, it is suggestive that Hieger and others produced sarcomas in mice by injecting unsaponifiable fractions of the fats extracted from livers not only of patients who had died of cancer but also of non-cancer patients. An invariable constituent of such unsaponifiable fractions is cholesterol, which is notoriously difficult to obtain in a state of complete chemical purity. Tumours have also been induced, in a small proportion of the treated mice, with cholesterol samples of various degrees of purity as well as with products formed by oxidation of cholesterol.

Cholesterol and the related bile acids are also of interest from another standpoint. Haslewood and I showed about twenty years ago that the hydrocarbon methylcholanthrene, which may be obtained by relatively simple procedures, involving oxidations, reductions, dehydrations, and dehydrogenations, from some of the bile acids—notably deoxycholic acid—is a very powerful carcinogen. It is a member of the 1:2-benzanthracene group and is closely related to other carcinogens of this group. May it not be that, under some conditions not yet defined, natural steroids present in the body undergo similar chemical transformation into either methylcholanthrene or a related carcinogen? There is no evidence to support this other than a suggestive structural relationship; but it is a possibility which should not be too lightly dismissed.

Sunlight

Then there is skin cancer other than the industrial forms which are known now to be due to the action of chemical carcinogenic agents. I have been surprised to find that this has been stated to be the most common form of cancer in the United States; but it is undoubtedly very prevalent in some parts of the world, especially among people who undergo prolonged exposure to strong sunlight, such as farmers in Australia and South Africa. And there is a precancerous skin condition among seamen that has been called seamen's skin. Excessive exposure to strong sunlight is undoubtedly the primary cause of much of this skin cancer, and skin tumours have been produced experimentally in rats by prolonged exposure to sunlight.

The rays of the sun may have a direction action on the cells; but it is at least possible that the action may be indirect and involve a photochemical conversion of some constituent of the skin into a chemical carcinogen. A substance which suggests itself in this connection is provitamin D, which is known to be converted into the vitamin by ultraviolet light. Provitamin D is closely related to cholesterol and is, in fact, cholesterol from the molecule of which two atoms of hydrogen have been abstracted. Recent work has shown that, by some relatively minor variations in the conditions of irradiation, the photochemical transformation of provitamin D may take a different course and give rise, by a modification of the ring system, to a substance known as an anthrasteroid, which has a structure not far removed from that of a carcinogenic hydrocarbon of the benzanthracene group. To the chemical mind there is no difficulty in imagining photochemical conversion of provitamin D to a chemical carcinogen. But again I am being fanciful and am speculating about changes which might well take place but for which there is no direct evidence.

Conclusion

I think, however, that I am on fairly safe ground in suggesting that, for some time to come, the study of chemical carcinogens is likely to prove one of the most profitable forms of cancer research and to give increasing insight into the nature of malignant change. Such lines of investigation will not necessarily point the way to cancer cures; but, if we can achieve a better understanding of the nature and origins of cancer, there is a good chance that, just as with industrial forms of cancer, the way may be open to prevent the onslaught of this great enemy of mankind. The road may be hard and long, but the impressive advances of knowledge of cancer in the past half-century give good grounds for hope that the goal may eventually be reached.

RESPONSE TO ALCOHOL IN CHRONIC ALCOHOLICS WITH LIVER DISEASE*

CLINICAL, PATHOLOGICAL, AND METABOLIC CHANGES

W. H. J. SUMMERSKILL
M.A., D.M. Oxfd, M.R.C.P.
ROCKEFELLER TRAVELLING FELLOW OF THE MEDICAL RESEARCH COUNCIL

STANLEY J. WOLFE
M.D. Harvard
PUBLIC HEALTH SERVICE RESEARCH FELLOW OF THE NATIONAL HEART INSTITUTE

CHARLES S. DAVIDSON
M.D. McGill, F.A.C.P.
ASSOCIATE PROFESSOR OF MEDICINE, HARVARD MEDICAL SCHOOL

From the Thorndike Memorial Laboratory and Second and Fourth (Harvard) Medical Services, Boston City Hospital, and the Department of Medicine, Harvard Medical School, Boston, Massachusetts

THE clinical association between liver disease, chronic alcoholism, and malnutrition is accepted, but the relationship of any one of these factors to the others remains unresolved.

There is a geographical correlation between the incidence of human malnutrition and cirrhosis; and diets lacking lipotropic substances, particularly choline and methionine, will induce fatty change and fibrosis, similar to those in the human liver, in laboratory animals

* This work was supported in part by the Office of the Surgeon General, Department of the Army, in part by a grant from Merck & Co., Inc., Rahway, New Jersey, and in part by a grant from Lederle Laboratories Division of American Cyanamid Company, Pearl River, New York, to Harvard University.

TABLE I—PATIENTS, DIAGNOSIS, AND DETAILS OF DIET

Case no.	Age (yr.)	Sex	Histological diagnosis	Daily intake of 95% alcohol (ml.)	Duration of alcohol treatment (days)	Details of daily diet		
						Calculated protein (g.)	Total calories	
							Control period	Including alcohol
1	41	F	Portal cirrhosis and fatty vacuolisation	90	21	65	2770	3350
2	61	M	Portal cirrhosis and fatty vacuolisation	120	32	60	2800	3400
3	67	M	Fatty vacuolisation	120	20	25	2500	2500
4	45	M	Portal cirrhosis	90	10	61	2480	3000
5	58	M	Portal cirrhosis and fatty vacuolisation	120	14	60	2550	2550
6	33	M	Portal cirrhosis and fatty vacuolisation	120	24	25	2300	2300
7	42	M	Portal cirrhosis and fatty vacuolisation	90	21	65	2770	3150

(Himsworth 1950). Attempts to extend these observations to the treatment of liver disease in alcoholics with such agents have been unsuccessful (Phillips and Davidson 1954), although Patek and Post (1941) showed that a diet high in protein, calories, and vitamins, together with rest in bed and abstention from alcohol, produced clinical improvement. Later work, however, showed that recovery was also possible with a relatively low intake of protein (Klatskin and Yesner 1949), thus emphasising the importance of abstention from alcohol and of a hospital regimen.

An action specific to alcohol and leading to the appearance of fat and fibrosis in the liver has not been established in either man or other animals, but it has been shown that alcohol enhances the toxic effect of certain agents on the liver of laboratory animals (Rosenthal 1930). It has therefore been postulated that hepatic disease results from the combination of excessive alcohol intake and dietary deficiency. Results of experiments on animals further indicate that the high caloric content of alcohol may increase the demand for lipotropic substances and thereby lead to pathological changes in the liver despite an otherwise adequate diet (Best et al. 1949). Reports on the effect of alcohol in human patients with liver disease are limited to the observations that the addition of alcohol to the diets of 1 inpatient (Volwiler et al. 1948) and 4 outpatients (Patek and Post 1941) did not interrupt their satisfactory progress.

The characteristic protein malnutrition of the alcoholic has been related to economic factors and pathological changes in appetite, but calories derived from alcohol do not spare nitrogen in animals on low-protein diets (Mitchell and Curzon 1940), and the same action may operate in man.

In an attempt to elucidate further the relationship between liver disease, alcoholism, and malnutrition we allowed alcohol to 7 patients already exhibiting these features. Their intakes of protein were 25–65 g. daily in the presence of adequate calories. Some of the patients had calories derived from alcohol added to their diet, but others were maintained on an isocaloric regimen. Nitrogen balances were recorded, and the effect on the course of the liver disease was followed by liver biopsy and serial liver-function tests.

Material

Observations were made on 7 patients (6 male and 1 female) aged 33–67 (table I).

All the patients had been either unemployed or doing casual work in bars or restaurants, and the 5 married patients were either divorced or living apart from their spouses. Their domestic environment was always unsatisfactory, and their nutritional histories revealed that, apart from alcohol, sandwiches were the main source of food during periods of drinking. The female patient (case 1) was reluctant to divulge her alcoholic habits, whereas the other patients admitted drinking heavily for 20–40 years. Cases 2 and 3 indulged in prolonged sprees, but cases 4–7 were steady drinkers. The confessed intake is exemplified by case 7 (10 cans of beer and 7 shots of whisky daily) and case 6, whose preference for wine led to a daily consumption exceeding 5 quarts. Except case 1, all the patients gave a history of "shakes," "jitters," "cold sweats," "dry heaves," or other disorders incident to alcoholism, and case 6 admitted previous hospital treatment for delirium tremens and "rum fits."

There was no history suggesting hepatic disorder until the period just before admission to hospital, but every patient had clinical signs of liver disease. 4 patients (cases 3, 5, 6, and 7) were icteric, and 3 (cases 2, 4, and 6) had ascites on admission, but alcohol was not given until these complications had improved. Liver biopsy revealed portal cirrhosis and fatty infiltration in 5 patients (cases 1, 3, 4, 5, and 7), cirrhosis without fat in case 4, and fatty vacuolisation without fibrosis in case 3.

Muscle mass was reduced in all the patients, and in 5 (cases 1, 2, 5, 6, and 7) peripheral neuritis was the cause of admission to hospital, being sufficiently severe either to cause gross abnormality of gait or to prevent walking unaided. Case 5 had mild Korsakoff psychosis and stigmata of recent scurvy.

Methods

The patients were up and about in the ward of the Thorndike Memorial Laboratory, and their weight, temperature, pulse-rate, and output of fæces and urine were recorded daily. After a period of equilibration on the prescribed diet the patients were studied during an 8-day control period, during alcohol consumption, and for 8 days after the alcohol had been withheld. Biochemical determinations and liver biopsies were done on the last day of the initial control period and when the alcohol was withheld. Liver biopsies were made at about the same site in each patient with a Vim Silverman needle. The histological interpretation of these specimens was undertaken by an independent observer, Dr. D. Campagna-Pinto, of the Mallory Institute of Pathology, to whom we are most grateful.

Diets and Alcohol Consumption

The daily diets contained adequate calories (2800–2285) and multivitamin supplements.† The calculated content of protein was 25–65 g. daily, and, on analysis, the diets contained 4·0–10·9 g. of nitrogen.

After the initial control period alcohol was given as 95% ethyl alcohol in fruit juice in divided doses six times daily for 10–32 days. The total daily intakes of alcohol were 90–120 ml. Alcohol was added to the caloric intake in 3 patients (cases 1, 2, and 4), and 3 patients (cases 3, 5, and 6) were kept on an isocaloric regimen by the deduction of carbohydrate from the diet during the treatment with alcohol. In case 7 the carbohydrate equivalent of rather less than the caloric value of the alcohol was withheld.

† 'Vi-Magna Granules' provided through the courtesy of Lederle Laboratories Division, American Cyanamid Company, New York.

Nitrogen Balances

Nitrogen balances were studied in every patient except case 1. After the period of equilibration either 2-day or 4-day specimens of urine and of fæces were collected throughout the study and analysed for total nitrogen content.

Biochemical Methods

Liver-function tests were made by methods reported earlier (Phillips and Davidson 1954). Blood-alcohol levels were determined by the technique of Conway (1950) and total nitrogen contents of diets, urine, and fæces by standard Kjeldahl procedures. Starch-tolerance tests were made in 2 patients by the method of Althausen and Uyeyama (1954).

Results

General Observations

The consumption of alcohol appeared to have no adverse effect on the clinical condition of any patient. Case 5 developed pyrexia (102°F) with increasing jaundice during treatment with alcohol but recovered during continuation of the regimen, and a similar episode occurred several days after alcohol had been withheld. Mild pyrexia (99–100°F), considered to be related to the liver disease, was present in 5 patients during the initial control period. In every instance the body-temperature fell gradually towards normal either before or during treatment with alcohol.

The effect of alcohol on the appetite was striking. At the beginning of the study anorexia was usually severe, and difficulty was experienced in keeping the dietary intake constant at this stage in 4 patients (cases 3, 5, 6, and 7). The addition of alcohol to the diet led to rapid improvement in appetite, regardless of the total caloric intake, in every patient. This increased desire for food continued after alcohol had been withheld, by which time the general condition had improved.

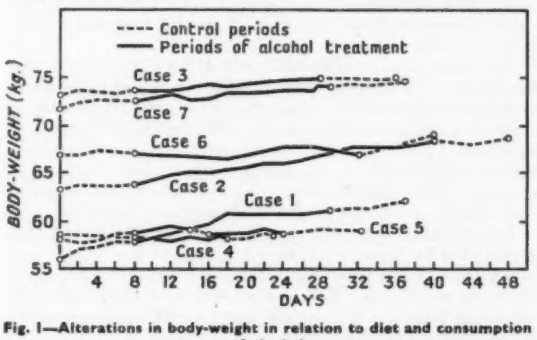


Fig. 1—Alterations in body-weight in relation to diet and consumption of alcohol.

Most of the patients were more alert, euphoric, and coöperative during treatment with alcohol. There was no evidence of gross inebriation, but intermittent drowsiness (cases 5 and 6) and unsteadiness of gait (cases 2 and 6) were observed. Case 7 exhibited mild withdrawal symptoms—tremor, with disordered speech and behaviour—when the alcohol was withheld.

In cases 5 and 7 the size of the liver, assessed by physical examination, became smaller during alcohol consumption, and all the patients with peripheral neuritis (cases 1, 2, 5, 6, and 7) steadily improved in muscle power and gait.

Body-weight and Nitrogen Balance

Alterations in body-weight in relation to the administration of alcohol are shown in fig. 1. 3 patients were on an isocaloric regimen, receiving either 25 or 60 g. of protein daily, and there was no significant change in weight in 2 of them (cases 5 and 6). The 3rd patient (case 3), whose diet contained 25 g. of protein daily, gained 1·2 kg. during a 21-day course of alcohol, but this was in proportion to his weight gain during the initial control period.

TABLE II—BIOCHEMICAL FINDINGS BEFORE AND AFTER TREATMENT WITH ALCOHOL

—		Serum-bilirubin (mg. per 100 ml.)	Serum-albumin (g. per 100 ml.)	Serum-globulin (g. per 100 ml.)	Bromsulphalein retention at 45 mins. (%)	Cephalin flocculation (units)	Blood-alcohol (mg. per 100 ml.)
Normal values ..		<1·0	>4·0	<2·5	<5·0	1+	0
Case no.							
1*	Before alcohol	0·4	3·4	3·3	17·3	0	0
	After alcohol	0·4	3·8	2·4	14·3	0	46·1
2	Before alcohol	1·1	4·3	2·0	30·0	1+	0
	After alcohol	0·8	4·4	1·9	23·0	0	17·0
3	Before alcohol	0·6	3·6	2·3	11·5	2+	0
	After alcohol	0·6	3·8	2·2	8·4	1+	46·5
4	Before alcohol	0·6	2·4	3·9	2·8	0	..
	After alcohol	0·5	3·6	2·7	2·3	0	..
5	Before alcohol	1·5	4·2	2·6	42·0	3+	..
	During alcohol	(1) 8·5	3·7	2·9	..	3+	..
		(2) 5·1	..	..	..	..	..
	After alcohol	(1) 1·1	4·1	3·0	19·6	0	..
		(2) 7·1	..	..	..	1+	..
6	Before alcohol	0·7	3·7	1·3	20·4	1+	..
	After alcohol	0·5	3·8	1·8	10·8	0	..
7*	Before alcohol	0·4	3·2	2·5	10·6	0	0
	After alcohol	0·3	3·3	3·0	5·4	0	17·3

* Starch-tolerance tests also made before and after consumption of alcohol.

3 patients whose diet contained 60–65 g. of protein daily received the calories from alcohol in addition to those derived from the diet. Case 2, whose weight was relatively constant before and after treatment with alcohol, gained 3·6 kg. during a 32-day course of alcohol. Case 1's weight increased rapidly during the initial control period and continued to do so when alcohol was added, but the rate of increase diminished as time progressed and was not clearly related to the alcohol alone. In contrast, case 4's weight remained constant before, during, and after alcohol was given.

During alcohol consumption case 7's intake was increased by 370 calories, rather less than the equivalent of the alcohol he received, and in the 3-week period he gained only 1·4 kg., an increase similar to that occurring before and after alcohol was allowed.

The increases in weight of these patients were most closely related to the total calorie content of their diet (table I) and were greatest in cases 1 and 2, who received 3350 and 3400 calories respectively. Except case 4, the patients who gained little or no weight were those on smaller caloric intakes. The capacity to gain weight was not related to the severity of liver disease judged by liver-function tests (table II) and histological appearances (table III).

There was no evidence that alcohol consumption had any constant or significant effect on nitrogen balance (table IV). The retention of nitrogen was greatest in patients receiving the larger amounts of protein, and the balance was barely positive in cases 3 and 6, who were given only 25 g. of protein daily. These findings were comparable in each patient before, during, and after consumption of alcohol. The retention of nitrogen was not increased by increasing the caloric intake with alcohol in 3 patients (cases 2, 4, and 7), nor was it greatly altered during alcohol administration in patients maintained on an isocaloric regimen (cases 3, 5, and 6).

Urinary loss of nitrogen was definitely greater in case 5 and smaller in cases 3 and 4 during consumption of alcohol, but little change was observed in the remainder. Similarly, the nitrogen content of the fæces was usually

TABLE III—HISTOLOGICAL FINDINGS ON LIVER BIOPSY BEFORE AND AFTER ALCOHOL CONSUMPTION

Case no.	—	Derangement of liver pattern	Portal space			Liver lobule				
			Fibrosis	Cellular infiltration	Bile-duct proliferation	Fat	Alcoholic hyaline	Polymorph infiltration	Necrosis	Nuclear changes
1	Before alcohol ..	+ +	+ +	+ Mixed	+	+ + +	0	+	0	+
	After alcohol ..	+ +	+	+	+ (less)	+ +	0	+	0	+
2	Before alcohol ..	+ + +	+ + +	+ + Polys.	+ +	+	+ + +	+ + +	+ +	+
	After alcohol ..	+ + +	+ + +	+ Polys.	+	0	+	+	0	+
3	Before alcohol ..	0	0	+ Lymphs.	0	+	0	0	0	+ +
	After alcohol ..	0	0	+ Lymphs.	0	+ (less)	0	0	0	+
4	Before alcohol ..	+	+	+ Mixed	+	0	0	0	0	+
	After alcohol ..	+	+ +	+ +	+	0	0	0	0	+
5	Before alcohol ..	+ +	+ +	+ + Polys.	+	+	+ +	+ +	+	+
6	Before alcohol ..	+	+ +	+ Mixed	+	+	0	+	0	+
	After alcohol ..	+	+ +	+ Mixed	0	0	0	0	0	+
7	Before alcohol ..	+	+	+ Polys.	0	+ + +	0	+	0	+
	After alcohol ..	+	+	+ Polys.	0	+	0	+	0	+

unaffected by alcohol consumption, but it was smaller in case 5 and larger in case 4.

Biochemical Changes in Relation to Alcohol Administration

Liver-function tests were made immediately before and after the course of alcohol in every patient (table II). In no case was there any deterioration, and in most cases clear evidence of improvement was obtained.

Serum-bilirubin levels either fell or remained unchanged in every patient, but values above 1·0 mg. per 100 ml. were present initially in only cases 2 and 5. Case 5 developed pyrexia with hepatic enlargement and increasing jaundice (serum-bilirubin level rising from 1·5 to 8·5 mg. per 100 ml.) 5 days after the administration of alcohol. Alcohol was omitted for 2 days, by which time the serum-bilirubin level had fallen to 5·1 mg. per 100 ml., and the alcohol was then resumed. Clinical improvement continued; and, when alcohol was finally withheld, the serum-bilirubin level had fallen to 1·1 mg. per 100 ml. We therefore considered that the deterioration shown by liver-function tests was unrelated to the consumption of alcohol, and this was supported by the onset of a second brief episode of pyrexia and jaundice (serum-bilirubin level 7·1 mg. per 100 ml.) 5 days after alcohol had been withheld.

Serum-albumin levels either rose or remained relatively unchanged in every patient during consumption of alcohol, whereas *serum-globulin* levels fell in 2 patients (cases 1 and 4) and rose in 3 others (cases 5, 6, and 7). *Flocculation tests* were unchanged in 3 cases but were less strongly positive after consumption of alcohol in 4 patients (cases 2, 3, 5, and 6). The retention of bromsulphalein was less after alcohol administration in every patient, strikingly so in 3 patients (cases 5, 6, and 7).

Improvement in *liver-function tests* was greatest in patients in whom they were most grossly abnormal initially (cases 2, 3, 5, and 6) and was unrelated either to the constitution of the diet or to the dosage of, and duration of alcohol administration.

Pancreatic function before and after the course of alcohol was assessed in 2 patients (cases 1 and 7) by the starch-tolerance test, and no change was observed. Similarly, there was no change in the levels of *sodium, potassium, chloride, and non-protein nitrogen in the serum* in relation to the consumption of alcohol in any patient. *Blood-alcohol* levels, determined in 4 patients, were 17·0–46·5 mg. per 100 ml.

Hepatic Histology in Relation to Alcohol Consumption

Histological abnormalities in the liver were present in every patient and, except in case 5, liver biopsy was done both immediately before and after the treatment with alcohol (table III).

The gross abnormality of liver pattern always remained unaltered, and the degree of portal fibrosis and infiltration was usually the same, although both appeared greater in case 4. On the other hand, less portal fibrosis was observed in the second biopsy in case 1, and cellular infiltration of the portal space became less obvious in case 2. The proliferation of bile-ducts was less after the course of alcohol in 2 patients (cases 2 and 6), and a less striking decrease was seen in case 1, but it was unaffected in the remainder.

Changes in the liver lobule during alcohol consumption were more striking. Fat was present in 5 of the patients who had biopsies before and after alcohol. The amount of fat, judged histologically, was clearly less after alcohol in 4 patients (cases 1, 2, 6, and 7) and appeared to be less in case 3. Alcoholic hyaline (Mallory 1911) was greatly reduced and liver-cell necrosis no longer evident after alcohol in the patient who presented these abnormalities (case 2). Polymorph infiltration was present initially in 4 patients and decreased after alcohol in 2 of them (cases 2 and 6) but remained unchanged in the others (cases 1 and 7). Nuclear abnormalities of the liver-cells were present in every patient, but after alcohol they were less obvious or no longer apparent in 3 patients (cases 3, 6, and 7) and unaffected in the other 3 patients.

TABLE IV—NITROGEN BALANCES IN RELATION TO DIET AND CONSUMPTION OF ALCOHOL

Case no.	Body-weight (kg.)		Daily intake of nitrogen (g.)	Daily output of nitrogen (g.)								
				Before alcohol			During alcohol			After alcohol		
	Before alcohol	After alcohol		Urine	Fæces	Balance	Urine	Fæces	Balance	Urine	Fæces	Balance
2	64·8	68·4	10·9	4·52	1·97	+4·41	4·86	1·61	+4·43	5·40	1·00	+4·50
3*	73·6	74·8	4·0	4·37	0·22	−0·59	2·19	0·39	+1·42	3·70	0·93	−0·63
4	58·2	58·6	7·9	2·48	0·79	+4·63	1·81	1·73	+4·36	2·90	0·56	+4·44
5*	58·4	58·4	9·7	3·12	1·12	+5·46	4·67	0·66	+4·37	5·83	0·67	+3·20
6*	67·0	67·0	4·0	2·70	0·30	+1·00	2·20	0·37	+1·43	1·60	0·28	+2·12
7	72·6	74·0	9·6	4·17	0·69	+4·74	4·17	0·50	+4·93	4·16	0·74	+4·70

* Diet isocaloric throughout study.

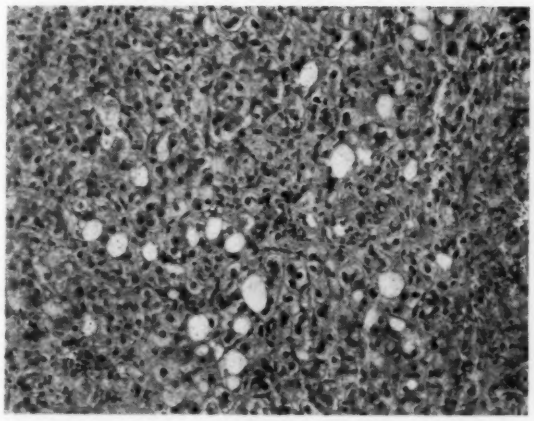


Fig. 2—Case 2: liver biopsy before administration of alcohol (× 158).

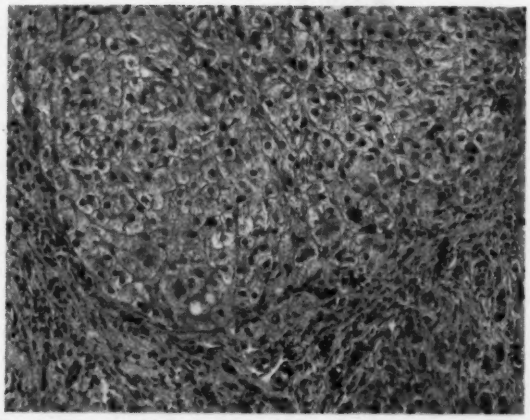


Fig. 3—Case 2: liver biopsy after administration of alcohol (× 158).

The best-defined improvements in histological appearances were found either in patients who received the longer courses of alcohol, with consequently a greater interval between the two liver biopsies, or when the initial changes were most severe. Case 2, who received the larger daily intake of alcohol for the longest period (32 days), exhibited the greatest degree of improvement (figs. 2–5), whereas case 4 had a short course of alcohol with little alteration in histological findings. The pathological changes, particularly the fatty infiltration, could not be related either to the caloric intake or to the protein content of the diet.

Discussion

In no patient was an adverse metabolic effect attributable to consumption of alcohol. Most of the patients improved clinically, with corresponding changes in liver-function tests and histology. The rate of recovery in these respects was comparable to that reported by Volwiler et al. (1948) in response to diets high in protein and calories together with abstention from alcohol, but the possibility cannot be excluded that improvement may have been delayed by alcohol in our patients in a degree too subtle to be appreciated in the absence of controls.

The most striking clinical effects of alcohol were the increased appetite and the euphoria that immediately followed its addition to the regimen. These facts suggest that small doses of alcohol should be given therapeutically to alcoholics with liver disease, because the anorexia which often complicates their management may be due to abstention from alcohol. Alcohol did not impede the improvement of peripheral neuritis, as Strauss (1935) has shown earlier, and the liver became smaller during treatment with alcohol in 2 patients, 1 of whom also recovered simultaneously from jaundice. The increases in body-weight suggest that the alcoholic with liver disease can use calories from alcohol in the dosage given and possibly in larger dosages (Newman 1949), although they may not be directly available as a source of muscular energy (Mitchell and Curzon 1940).

Nitrogen balance was more clearly related to the protein intake than to the calories consumed or to the severity of the liver disease. It was maintained with difficulty, if at all, on the diet containing only 25 g. of protein, but these patients made satisfactory progress. The addition of alcohol did not influence the nitrogen balance; this fact supports the view that the protein malnutrition of alcoholism is an expression of dietary deficiency alone. In particular, there was no evidence of an effect of alcohol on pancreatic function, because the nitrogen content of the fæces remained constant and, in 2 patients thus studied, starch-tolerance tests were unaffected.

Derangement of liver-function tests and hepatic histology was usually diminished after alcohol administration. Although there was a poor relationship between the biochemical and pathological changes, the degree of

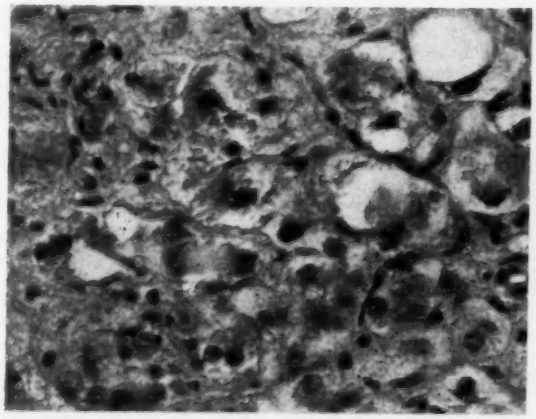


Fig. 4—Case 2: liver biopsy before administration of alcohol (× 602).

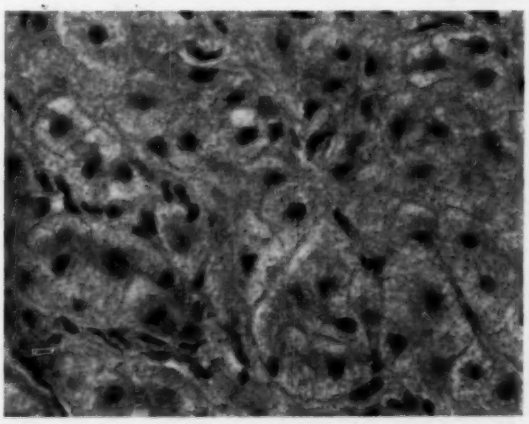


Fig. 5—Case 2: liver biopsy after administration of alcohol (× 602).

improvement in both was related more closely to the severity of the initial abnormalities and to the length of time between observations than to the constitution of the diets. Thus the lack of alteration in the amount of portal fibrosis during treatment with alcohol was attributable to the short duration of the study, whereas the more acute changes of cellular infiltration, alcoholic hyaline, and either necrosis or nuclear abnormalities of the liver-cells diminished or disappeared. Excess fat in the liver decreased after alcohol was given. The cause of fatty vacuolisation is uncertain, but the results of experiments on animals relate the presence of fat to a high caloric intake from alcohol or from sucrose in the absence of adequate lipotropic substances (Ashworth 1947, Best et al. 1949). Klatskin et al. (1954), confirming that alcohol increases the choline requirement, considered that the effect was independent of the caloric intake. In our patients fat disappeared from the liver regardless of the total intake of calories or of alcohol and wher the diet was marginal in protein content, although not necessarily so in lipotropic factors. However, patients on a diet devoid of protein do not show any convincing diminution in liver fat (Phillips et al. 1952), and it is therefore possible that the limitation of protein and the intakes of calories and alcohol used in this study were insufficient to delay significantly improvement in hepatic histology.

The factors of importance in the genesis of liver disease in the chronic alcoholic consequently remain obscure. No clinical or pathological improvement takes place during rest in bed with adequate calories, minerals, and vitamins, and abstention from alcohol (Phillips et al. 1952), even when choline is added to the regimen (Phillips and Davidson 1954). Recovery may be initiated, however, by relatively small amounts of protein in the diet (Gabuzda and Davidson 1954), and we confirmed this.

The consumption of alcohol may be a determining factor in deterioration of liver function, but we did not find any adverse clinical, pathological, or metabolic effect, even on marginal intakes of protein. Interpretation of our results demands recognition of the differences that existed between the hospital regimen and the way of life normally pursued by these patients. Although the amount of alcohol given was in most cases equivalent to half a pint of spirits daily and exceeded that prescribed in similar circumstances by earlier workers (Patek and Post 1941, Volwiler et al. 1948) it was nevertheless smaller than that to which many such patients have become accustomed. Similarly, even the low-protein diets given in hospital were probably more adequate than the food usually taken during periods of drinking. On the other hand, the alcohol consumed was more than sufficient to satisfy the criteria of chronic alcoholism in liver disease (Olsen 1950), and nitrogen balance was precarious on the diets containing the least amounts of protein. Furthermore, it may be argued that any deleterious effect of alcohol and dietary deficiency should have been rapidly apparent in these patients, because malnutrition and hepatic disease were already established.

We therefore conclude that, if a combination of alcohol and dietary deficiency contributes to liver disease in the chronic alcoholic, it is in excess of what can reasonably be reproduced in a study of this nature.

Summary

7 chronic alcoholics with liver disease and malnutrition were given 90–120 ml. of 95% ethyl alcohol daily.

The protein content of the diet varied from 25 g., on which the nitrogen balance was marginal, to 65 g. daily. The diet of 3 patients was kept isocaloric, but the remaining 4 patients received alcohol in addition to the previous caloric intake.

Consumption of alcohol was accompanied by euphoria and increased appetite.

Increased body-weight showed that calories from alcohol could be used by these patients, and nitrogen balances were not changed by alcohol.

Liver biopsies and biochemical liver-function tests did not reveal any adverse effect of alcohol.

If alcohol alone or in combination with inadequate protein nutrition contributes to liver disease in the alcoholic, these factors are greatly in excess of those reproduced in this study.

Alcohol may have a place in the treatment of alcoholics with liver disease.

We are grateful to Miss E. Antonaros and Miss M. F. Bradley for dietetic assistance; to Miss A. N. Ballou and Miss E. A. Hirshberg for the biochemical determinations; and to Miss L. Leavitt for the histological preparations.

REFERENCES

Althausen, T. L., Uyeyama, K. (1954) *Ann. intern. Med.* **41**, 563.
Ashworth, C. T. (1947) *Proc. Soc. exp. Biol., N.Y.* **66**, 382.
Best, C. H., Hartroft, W. S., Lucas, C. C., Ridout, J. H. (1949) *Brit. med. J.* ii, 1001.
Conway, E. J. (1950) Microdiffusion Analysis and Volumetric Error. 3rd ed., London.
Gabuzda, G. J. jun., Davidson, C. S. (1954) *Ann. N. Y. Acad. Sci.* **57**, 776.
Himsworth, H. P. (1950) Lectures on the Liver and its Diseases. 2nd ed., Cambridge, Mass.
Klatskin, G., Krehl, W. A., Conn, H. O. (1954) *J. exp. Med.* **100**, 605.
— Yesner, R. (1949) *J. clin. Invest.* **28**, 723.
Mallory, F. B. (1911) *Johns Hopk. Hosp. Bull.* **22**, 69.
Mitchell, H. H., Curzon, E. G. (1940) *Quart. J. Stud. Alc.* **1**, 227.
Newman, H. W. (1949) *Science*, **109**, 594.
Olsen, A. Y. (1950) *Amer. J. med. Sci.* **220**, 477.
Patek, A. J. jun., Post, J. (1941) *J. clin. Invest.* **20**, 481.
Phillips, G. B., Davidson, C. S. (1954) *Ann. N. Y. Acad. Sci.* **57**, 812.
— Gabuzda, G. J. jun., Davidson, C. S. (1952) *J. clin. Invest.* **31**, 351.
Rosenthal, S. M. (1930) *J. Pharmacol.* **38**, 291.
Strauss, M. B. (1935) *Amer. J. med. Sci.* **189**, 378.
Volwiler, W., Jones, C. M., Mallory, T. B. (1948) *Gastroenterology*, **11**, 164.

ACUTE POLYNEURITIS TREATED WITH CORTISONE

G. S. GRAVESON
M.A., M.D. Camb., M.R.C.P.
CONSULTANT NEUROLOGIST, SOUTHAMPTON GENERAL HOSPITAL

THE cause of the disease, variously called acute toxic, febrile, or infectious polyneuritis, or the Landry-Guillain-Barré syndrome, has never been established with any certainty. Its frequent occurrence as a sequel to some non-specific febrile illness was originally thought to indicate that the peripheral nervous system was damaged by some toxic or infective agent, though none has ever been isolated from pathological material. In recent years the concept of the disease as an allergic manifestation has steadily been gaining ground. One of the first to suggest this was Furtado (1950). He argued that both its clinical manifestation as a "second illness" occurring within narrow time-limits after a primary infection and the characteristic changes in the protein content of the cerebrospinal fluid (C.S.F.) could best be explained by regarding it as a "peripheral form of neuro-allergy." He thought, too, that there might be a relationship between this illness, secondary to some unknown infection, and those types of polyneuritis complicating known infections, such as diphtheria and glandular fever, or the introduction of foreign proteins, such as injected serum.

At the same time fresh histological studies with modern techniques have shown that the pathological changes in the disease are not those of a primary inflammation. Haymaker and Kernohan (1949), in a most extensive and impressive review of the subject based on the findings of fifty fatal cases, showed that, for the first 3 or 4 days of the illness, the only change was œdema of the nerve-roots. This was followed by disintegration of myelin sheaths and axis-cylinders, but only in the 2nd week of the illness did a cellular reaction

develop. Much the same findings were reported by Scheinker (1949), who thought that the œdema of the roots caused paralysis by mechanical constriction of the radicular nerves at their points of penetration of the spinal meninges.

Final proof that polyneuritis can be allergic in origin is provided by the interesting experimental work of Waksman and Adams (1955).

They have produced in rabbits, by injecting homologous or heterologous sciatic-nerve tissue plus an adjuvant (tubercle bacilli), a polyneuritis comparable to the human disease. This condition occurred about 14 days after inoculation, and progressed rapidly for about 3 days, after which, if the rabbit survived (as it usually did), a rapid and more or less complete recovery ensued. As in the Landry-Guillain-Barré syndrome, the polyneuritis was associated, in most cases but not all, with a rise of protein as the only change in the C.S.F. Pathologically, lesions were found in spinal roots, ganglia, and nerves. Myelin sheaths and axis-cylinders degenerated, and there was a cellular infiltration; but which came first, in such a brief and intense reaction, it was difficult to be certain about.

Waksman and Adams compare this condition to experimental allergic encephalomyelitis produced by the injection of brain or cord tissue with adjuvants and known to be due to an immunological reaction.

Such, then, is the evidence supporting the hypothesis that acute toxic polyneuritis is an allergic disease and providing the rationale for its treatment with cortisone and corticotrophin (A.C.T.H.). First reports of its use were unfavourable. Shy and McEachern (1951) and Merritt (1952) each recorded, without detail, three cases which did not respond. Since 1952, however, cases have been described in which cortisone or corticotrophin halted the disease or even produced dramatic improvement and early cure (Stillman and Ganong 1952, Seltzer et al. 1952, Blood et al. 1953, Newey and Lubin 1953, Drenick and Avol 1953, Senseman and Greenstein 1953, Plum 1953, Vernon 1954, Guiang and Leones-Guiang 1954, Luzes 1954, Tupper and Foster 1954, Guichard et al. 1955).

In this country the only recorded case is case 3 of Clarke et al. (1954): cortisone was given to a man apparently in extremis with respiratory paralysis and cardiovascular failure, and he slowly recovered. These workers felt that the use of cortisone merited further investigation, and thought it especially indicated in cases pursuing a relentless course and those with respiratory failure or hypotensive cardiovascular collapse. Yet if allergy is the underlying basis of the disease and structural changes in peripheral nerves follow œdema, it seems more rational to use cortisone at the earliest possible opportunity before severe damage has been done to the nerves. It might then be expected to act rapidly and effectively, whereas, once nerve-fibres have been destroyed, no treatment is likely to hasten the normal process of repair. In this paper I attempt to show that such results are usually achieved in practice.

Clinical Study

In the past two years seven patients with acute toxic polyneuritis have been treated with cortisone. One patient (case 2) had two attacks. All showed the usual features of a symmetrical muscular weakness of varying severity associated with loss of tendon-reflexes, an increase of muscle tenderness, and peripheral sensory symptoms with or without objective sensory loss. All, except case 2, had an increase of protein as the only abnormal change in the C.S.F. Four (cases 1–4) are regarded as mild cases, and three (cases 5–7) as more severe—though none were exceptionally severe, for respiratory failure did not occur. All were given cortisone as soon as the diagnosis was established. The dosage used for cases 1–5 was 100 mg. daily for 2 days, 75 mg. daily for 2 days, and then 50 mg. daily for 10 days. The experience of case 6, however, showed that this schedule was insufficient for severer cases. Case 7 was therefore given 300 mg. daily for 2 days, then 200 mg. for 2 days, and 100 mg. daily thereafter.

Mild Cases

Case 1.—A boy of 14 was admitted to hospital on the 8th day of illness, complaining of progressive weakness of both arms and legs, with tingling in his fingers and feet.

Examination showed moderate generalised weakness of all muscle groups in his legs. He could stand and walk only with difficulty, knee and ankle jerks were absent, and plantar responses were flexor. Tenderness of the calves was increased, but there was no demonstrable loss of superficial or deep sensation. In the arms deltoid, biceps, triceps, and finger extensor muscles were weak. Biceps-jerks were sluggish, other arm reflexes were absent. There was slight bilateral facial weakness. The C.S.F. contained protein 400 mg. per 100 ml.

Cortisone was given on the day of admission and continued for 14 days. After 7 days there was no change in his condition and no new symptoms had arisen. In the 2nd week, however, he made a very rapid recovery, and by the 14th day his arms were normal except for fractional weakness of the triceps, and his legs were normally strong except for slight weakness of the toe and ankle extensors. He was then allowed to go home. A month later he had fully recovered.

Case 2.—A woman of 34 was first seen on Oct. 11, 1955, giving 4 weeks' history of shooting pains in her lower legs, with numbness and tingling in her feet, spreading up to her calves. Walking had become difficult, and she felt unsteady.

Examination showed a weakness of hip flexors, ankle dorsiflexors, and toe extensors and flexors in the legs, and of deltoid, biceps, and triceps in the arms. All tendon-reflexes were absent. Calf tenderness was increased and vibration sense lost at the ankles, but there was no loss of superficial sensation. The C.S.F. was normal (protein 10 mg. per 100 ml.).

Cortisone was given for 2 weeks. As in case 1, there was no change after 7 days, but improvement was rapid in the 2nd week, and after 14 days muscular power was normal in her limbs and she was symptom-free.

She remained well until June, 1956, when her symptoms recurred and slowly progressed until she was seen 6 weeks later. By then her walking was unsteady and she had continuous tingling over the legs below the knees and from the mid-forearms distally. In the arms all muscle groups were weak, but there was no sensory loss. In the legs weakness affected the hip flexors and all muscles below the knees. Superficial sensation to pain and touch was diminished almost up to the groins, and muscle tenderness was increased. She was treated at home with cortisone for 2 weeks. By then the only remaining signs were a very slight weakness of triceps and hip flexors and the persistence of increased calf tenderness. These improved spontaneously without further treatment during the next month. Her tendon-reflexes remained absent after her first attack.

Case 3.—A woman of 56 was admitted to a surgical ward on Nov. 1, 1955, for treatment of hiatus hernia. During the previous 3 weeks she had had increasing weakness of her arms and legs to a point where she could no longer walk, and also continuous tinglings in her hands and feet.

When I saw her on Nov. 8 she showed a moderately severe weakness of all muscle groups in both arms and legs, though no group was completely paralysed. Tendon-jerks were absent in the legs and diminished in the arms, muscle tenderness was increased, and she had hyperalgesia over her soles. The C.S.F. contained protein 100 mg. per 100 ml.

She was transferred to a medical ward, and cortisone treatment was started on Nov. 13—i.e., 5 weeks after the onset of her symptoms. There had been no progression in the week before treatment began. Improvement began within 48 hours and continued rapidly and steadily until, at the end of the 2 weeks' course, no residual weakness or sensory signs were found.

Case 4.—A man of 56 was admitted to hospital on Feb. 25, 1956. 2 weeks previously he had had a transient feverish illness with aches and pains in his limbs and back. He stayed in bed for a day. 5 days later his legs felt weak while he was out walking, and later that day he found he could not use his fingers properly. This limb weakness had increased slightly, but he was still able to walk. There was no tingling or numbness in his extremities.

Examination showed a slight bifacial weakness; in the arms a weakness of biceps, triceps, forearm, and hand muscles;

in the legs weakness of hip flexors and all muscles below the knees. The arm-reflexes and the ankle-jerks were absent, the knee-jerks sluggishly present. Calf tenderness was increased. There was no sensory loss. The C.S.F. contained protein 90 mg. per 100 ml.

Cortisone treatment was started on Feb. 26—i.e., 10 days after the onset of his polyneuritis. After 3 days improvement in power was obvious, and this continued steadily until, after 2 weeks' treatment, he had completely recovered.

Severe Cases

Case 5.—A man of 64 was first seen on May 1, 1956. His illness had started 17 days previously with tingling over the soles of his feet. 2 days later his legs became weak and he fell at work. Thereafter progress was rapid, and within 10 days of the onset he was unable to walk and had developed paræsthesiæ in his hands.

Examination revealed profound weakness of his legs. He could raise his right leg two inches off the bed and the left one inch. Toe movements were flickers only. Tendon-jerks were absent, calf tenderness increased, joint sense impaired in the feet, and superficial sensation diminished below the knees. In the arms all muscle groups were affected but only moderately, no muscles being completely paralysed. Touch and pain sense were impaired below the level of the wrist-joints. The C.S.F. contained protein 55 mg. per 100 ml.

Cortisone treatment was started on May 1. After a week his arms were stronger but his legs showed no change. After 2 weeks power in his arms was normal save for fractional weakness of the triceps, and sensation had recovered, though he still had tinglings in his fingers. He could lift both legs two feet off the bed, but there had been no recovery in muscles below the knees. He was then transferred to a hospital nearer his home, where through a misunderstanding cortisone treatment was continued, 50 mg. daily, for another month. By this time he had no symptoms in his arms, his thigh muscles had recovered fully, but his lower-leg muscles were still moderately weak. After another 4 weeks—i.e., 10 weeks from the onset of treatment—he had completely recovered.

Case 6.—A man of 40 was seen on June 2, 1956. A week previously he had been slightly unwell for a day, with headache and pains in the back, which he had put down to a feverish cold. On May 30 he complained of stiffness in his legs and tingling in his fingers and toes, and these symptoms became worse.

Examination on June 2 showed minimal signs. There was just detectable weakness of hand muscles, hip flexors, and toe extensors, tendon-reflexes were diminished but not absent, calf tenderness was severe, and there was a little blunting of sensation over his feet. His C.S.F. contained protein 450 mg. per 100 ml.

Cortisone treatment was started on June 3. In the next 3 days his condition deteriorated slightly, weakness becoming slightly more evident in the muscles originally affected and also now involving deltoid, biceps, triceps, and toe flexors on each side, and the facial muscles. 2 days later slight improvement was evident in arms and legs, and on this day the dose of cortisone was reduced to 50 mg. daily (after 3 days on 100 mg. and 3 days on 75 mg. daily). 2 days later (June 10) he was much worse, with generalised weakness of face, arms, and legs, loss of reflexes, and sensory loss over feet and hands. He remained in this state for 10 days before improvement was first noted in arm muscles and face.

Cortisone was continued (50 mg. daily) for a further 10 days until June 30. By this time his arms and face had improved considerably but his legs less so. He was discharged home 2 weeks later (July 14), by which time his face was normal, only weakness of finger muscles remained in the arms, and he could stand and walk with assistance, though all groups of leg muscles were still weak. A month later he had completely recovered, his illness having lasted 10 weeks.

This patient was the only one of the series who did not respond to cortisone. In retrospect it was felt that dosage had been inadequate and that this was why he rather suddenly deteriorated when it was reduced.

Case 7.—A woman of 69 was transferred on Oct. 11, 1956, from another hospital, to which she had been admitted 11 weeks previously with a fracture of the neck of the left femur. This had been pinned and plated and was healing satisfactorily. She had begun to get about on crutches, avoiding weight-bearing on the left leg, when about 6 weeks before transfer she noticed that walking was becoming difficult. Gradually her legs became weaker until she could not move them; her fingers became feeble, and she developed at the same time tingling in fingers and feet.

On admission her legs were completely paralysed except for feeble movement of the hip flexors, and the arm muscles were all weak, but the finger flexors and intrinsic hand muscles were much more severely affected than other groups. Arm-reflexes were diminished, leg reflexes absent. Muscle tenderness was increased. Joint sense was impaired in the fingers and lost in the toes, but there was no alteration in skin sensation. Her C.S.F. contained protein 140 mg. per 100 ml.

She was given cortisone 300 mg. daily for 2 days, then 200 mg. daily for 2 days, and then 100 mg. daily thereafter. After a week weakness in the arms was confined to finger flexors and hand muscles. In the legs there was still no movement below the knees, but muscles in the thighs were now contracting. After 2 weeks hand and finger muscles were improved but not normal, and there had been a further slight improvement in the legs, with a flicker of contraction in the left toe extensors. Cortisone treatment was then stopped (Oct. 28). 3 days later slight weakness had recurred in biceps, triceps, and wrist extensors, and there was no contraction in the left toe extensors. She was then (Nov. 1) given 200 mg. daily for 2 days and then 100 mg. daily. After 4 days power had returned to these arm muscles, and they were normal again.

Cortisone was continued for 2 weeks and then stopped (Nov. 14). By that time she still had some weakness of the interossei in the hands, but they were much stronger. She could lift her legs well in the air, and the quadriceps, hamstrings, and calf muscles were quite strong, but there were only flicker movements of toe and ankle dorsiflexors and no movement in the peroneal group. There was no further relapse thereafter, and she slowly improved, though her recovery was not yet complete 7 weeks after the beginning of treatment.

Discussion

The severity of these cases has been judged not by the extent of the distribution of muscle weakness but by the degree of paralysis in the muscles worst affected. In the mild cases (cases 1–4) no muscles were completely paralysed, though paresis was moderately severe in most muscles in all four limbs. The results of treatment in this group are summarised in table I. They show that recovery was complete or almost so in all these cases after 2 weeks' treatment with a small dosage of cortisone. The more severe cases (cases 5–7), summarised in table II, are those in which some muscle groups were paralysed or reduced to flicker movement and others less affected.

TABLE I—RESULTS IN MILD CASES

Case no.	Sex	Age (yr.)	Degree of weakness	Onset before treatment	C.S.F. protein (mg. per 100 ml.)	After two weeks	Remarks
1	M	17	F + A + L +	10 days	400	F 0 A– + 90% L– + recovery	Improvement began in 2nd week
2	F	34	*1st attack, October, 1955:* F 0 A + L +	4 weeks	10	F 0 A 0 L 0	Improvement in 2nd week
			2nd attack, June, 1956: F 0 A + L +	6 weeks	..	F 0 A– + 95% L– + recovery	..
3	F	56	F 0 A + L +	3 weeks	100	F 0 A 0 L 0	Improvement began in 1st week
4	M	56	F – + A + L +	10 days	90	F 0 A 0 L 0	Improvement after 3 days

F, face. A, arm. L, leg.

\+ Diffuse weakness but no muscle group paralysed completely.
\+ + Diffuse weakness with one muscle group paralysed completely.
\+ + + Total or almost total limb paralysis.

TABLE II—RESULTS IN SEVERE CASES

Case no.	Sex	Age (yr.)	Degree of weakness	Onset before treatment	C.S.F. protein (mg. per 100 ml.)	After two weeks	Remarks
5	M	64	F 0 A + L + + +	17 days	55	F 0 A 0 L +	Improvement in 1st week. Complete recovery in 10 weeks. Cortisone continued for 6 weeks
6	M	40	F 0 A − + L − +	4 days	450	F + A + + L + +	Slight deterioration in first 5 days. Much worse 2 days after reduction of cortisone. Recovery after 10 weeks
7	F	69	F 0 A + + L + + +	6 weeks	140	F 0 A + L + +	Improvement in 1st week

This group includes case 6, where deterioration occurred in spite of treatment; this coincided with a reduction of the daily dose of cortisone, and treatment is thought to have been inadequate. The two other cases in this group showed improvement after 2 weeks but of varying extent. Muscles affected in these two patients to a similar degree as in the mild cases showed an equally good response and had by then completely recovered. More severely affected muscles, however, were still very weak, and some had not begun to recover. In case 7 a return of weakness followed within a few days of the cessation of cortisone therapy, but recovery was rapid when cortisone was given again. It is clear from tables I and II that recovery is not related to the duration of the illness before treatment begins but only to the severity of the paralysis at this time. In some cases improvement was apparent after a few days but in others it was not noticeable until the second week. Except in case 6, no deterioration took place once cortisone had been given.

It may well be thought that, in a disease whose severity and duration are very variable, these results are no better than chance would allow, especially as most of the patients had mild attacks. The disease is so relatively uncommon that a control series would be impossible to obtain in a reasonable time; and therefore comparison has to be made with the reports of others not treated with cortisone. The largest series in recent years is that of Crozier and Ainley (1955), who reviewed seventeen cases seen in 8 years. Three patients died, and the period of recovery in the survivors varied between 1 and 4 months. These figures show that the untreated disease, at best, lasts twice as long as when cortisone is given. I have found no published report of any patient having died of the disease after cortisone was given.

It seems justifiable, therefore, to conclude from this trial that cortisone is the remedy of choice in acute toxic polyneuritis but must be given as soon as possible and in adequate dosages. If treatment is started before paralysis becomes severe, the chances of rapid improvement should be good. Beyond this stage it should stop the disease from progressing, but the over-all recovery-time of completely paralysed muscles may not be shortened. In view of the pathology of the disease we may suppose that, to be effective, it must be given when œdema of nerve-roots is present and before structural changes have taken place. For the average case the dosage suggested is 300 mg. daily for 2 days, 200 mg. daily for 2 days, and then 100 mg. daily for 10 days. If, after withdrawal at this stage, deterioration occurs, further treatment for another week or more may be needed.

In fulminating cases of the Landry type, intravenous infusions of corticotrophin might well be more effective, but I have not yet had an opportunity to treat such a case.

The results of cortisone treatment support the opinion that this disease is an allergic disturbance. If further experience confirms this, the term acute allergic polyneuritis would be preferable to any of the various synonyms at present in vogue.

Summary

Eight attacks of acute polyneuritis in seven patients were treated with cortisone.

In only one case was the disease not promptly arrested, and in this case the amounts of cortisone given were probably inadequate.

In seven attacks recovery took place quickly within a period of 2 weeks in those muscles not severely affected—i.e., mild cases recovered completely, and severe cases improved partially.

Improvement is related to the severity of muscle weakness at the onset of treatment. Hence very early diagnosis is necessary for successful therapy.

I am grateful to Dr. Wilfred Brinton for referring cases 5 and 6 to me.

REFERENCES

Blood, A., Locke, W., Carabasi, R. (1953) *J. Amer. med. Ass.* **152**, 139.
Clarke, E., Bayliss, R. I. S., Cooper, R. (1954) *Brit. med. J.* ii, 1504.
Crozier, R. E., Ainley, A. B. (1955) *New Engl. J. Med.* **252**, 83.
Drenick, E. J., Avol, M. (1953) *Neurology*, **3**, 935.
Furtado, D. (1950) *Mschr. Psychiat. Neurol.* **119**, 264.
Guiang, R. V., Leones-Guiang, M. A. (1954) *J. Phil. Is. med. Ass.* **30**, 282.
Guichard, A., Delahaye, J. P., Pellet, M. (1955) *Lyon méd.* **87**, 51.
Haymaker, W., Kernohan, J. W. (1949) *Medicine, Baltimore*, **28**, 59.
Luzes, P. (1954) *Rev. neurol.* **90**, 132.
Merritt, H. H. (1952) *Yale J. Biol. Med.* **24**, 466.
Newey, J. A., Lubin, R. I. (1953) *J. Amer. med. Ass.* **152**, 137.
Plum, F. (1953) *Neurology*, **3**, 661.
Schelnker, I. M. (1949) *J. Neuropath.* **8**, 184.
Seltzer, H. S., Lichty, D. E., Conn, J. W. (1952) *Univ. Mich. med. Bull.* **18**, 27.
Senseman, L. A., Greenstein, J. (1953) *R. I. med. J.* **36**, 718.
Shy, G. M., McEachern, D. (1951) *Brain*, **74**, 354.
Stillman, J. S., Ganong, W. F. (1952) *New Engl. J. med.* **246**, 293.
Tupper, C. J., Foster, R. D. (1954) *U.S. Forces med. J.* **5**, 532.
Vernon, M. A. (1954) *Canad. med. Ass. J.* **70**, 75.
Waksman, B. H., Adams, R. D. (1955) *J. exp. Med.* **102**, 213.

MASSIVE THROMBOPHLEBITIS

B. N. CATCHFOLE
M.B. Manc., F.R.C.S.
LECTURER IN SURGERY, UNIVERSITY OF SHEFFIELD

MASSIVE thrombophlebitis (massive venous thrombosis, phlegmasia cærulea dolens) may rapidly kill a patient by immobilising large amounts of fluid and blood in the leg. Alternatively it may cause "stagnation" gangrene of the foot—a condition which may be confused with an arterial ischæmic lesion.

Massive thrombophlebitis is by no means uncommon, but it is probably often misdiagnosed and wrongly treated. I therefore report five cases, and discuss the physiopathology, differential diagnosis, and treatment.

Case-reports

Case 1.—A woman, aged 65, complaining of abdominal colic with the passage of blood and mucus per rectum, was admitted to hospital 10 months after the onset of her symptoms. There was a large tender mass in the left iliac fossa and left side of the pelvis. Shortly after admission she developed a colovesical fistula. A transverse colostomy was performed and some 12 days later she developed a classic "white leg" (phlegmasia alba dolens) on the left side. The limb was raised initially and mobilised early; no anti-coagulants were used.

On the 21st postoperative day she suddenly complained of intense pain in her right leg. This pain had reached its peak within 30 minutes and completely prohibited any movement, either active or passive.

The limb was cyanotic from the inguinal ligament to the toes, with abundant petechial hæmorrhages above and below

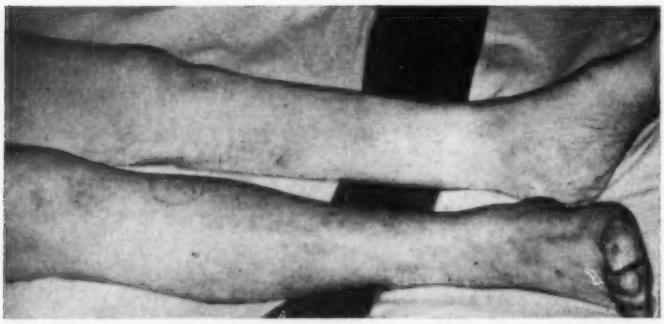


Fig. 1—Case 1: three hours after onset of massive thrombophlebitis in right leg. Left leg is recovering from iliofemoral thrombophlebitis. A group of petechial hæmorrhages is ringed.

the knee (fig. 1). It felt cool, and no pulse distal to that of the femoral artery at the groin was palpable; the involved skin was grossly hyperæsthetic. Intra-arterial (femoral) tolazoline ('Priscol') 50 mg. had no apparent effect on the condition of the limb. Œdema developed rapidly, and the patient became shocked. Transfusions of blood and of plasma did not arrest the fall of blood-pressure, and she died 16 hours after the onset of the pain.

At restricted necropsy an abscess was found surrounding a carcinoma of the pelvic colon which had eroded into the bladder. The left iliac veins were occluded by organising blood-clot; the lowest three inches of the inferior vena cava and the right iliac veins were obstructed by recent adherent clot. The corresponding arteries were patent.

Case 2.—A woman, aged 34, in her 9th month of pregnancy, was admitted to hospital with œdema of the lower legs and hydramnios. A stillborn anencephalic child was delivered 24 hours after artificial rupture of the membranes. 15 hours after delivery anticoagulant therapy was started because œdema had spread to the inguinal ligaments. During the next 3 days œdema persisted, but the circulation of the limbs was not impaired. The patient then complained of tingling in the toes of her left foot, which became cold and dark blue; œdema of the calf increased. Pain in the first and second toes worsened, and within 12 hours they had become virtually black (fig. 2).

The patient was then transferred to a vascular unit. She was not shocked, there was no evidence of any arterial insufficiency in her feet, and peripheral pulses were present; but her left leg was still œdematous to the groin. Anticoagulant therapy was stopped, and lumbar paravertebral block was performed—without benefit. The swelling of the limb slowly resolved, and the necrotic areas of the toes were allowed to demarcate before being surgically removed; complete healing was slow. The patient has since remained well but has to use elastic support to control the hydrostatic œdema of her left leg.

Fig. 2—Case 2: leg and foot.

Case 3.—A woman, aged 20, and 2 months pregnant, complained that for 4 months she had been passing multiple loose stools occasionally tinged with blood. 2 weeks before admission she had had a cramp-like pain in the left ankle and calf preventing her from bearing weight on the heel. Œdema of the foot followed 4 days later, and the calf pain, now bursting in character, was accompanied by a deep ache in the thigh. She next developed a cramp-like pain in the right calf for 4 days; there was no noticeable œdema, but the calf felt hard. Both legs then began to improve.

The patient was admitted to hospital for investigation owing to continued diarrhœa, and ulcerative colitis was diagnosed. 3 days after admission severe pain, reaching a maximum in 15 minutes, recurred in the left thigh. It spread slowly down the leg, which felt as though it would burst. The limb was blue to the groin, showed turgid veins, and rapidly swelled. Over the next 4 days both the colour and pain of the limb improved. 6 days after the onset of this episode she was woken at night by a burning pain in the left foot, with severe paræsthesiæ in the toes, which became deeply cyanosed. The foot swelled again, but toe movement was still possible. Within 10 minutes the burning sensation began to go, but paræsthesiæ persisted in the second and third toes, which became gangrenous in their distal portions (fig. 3).

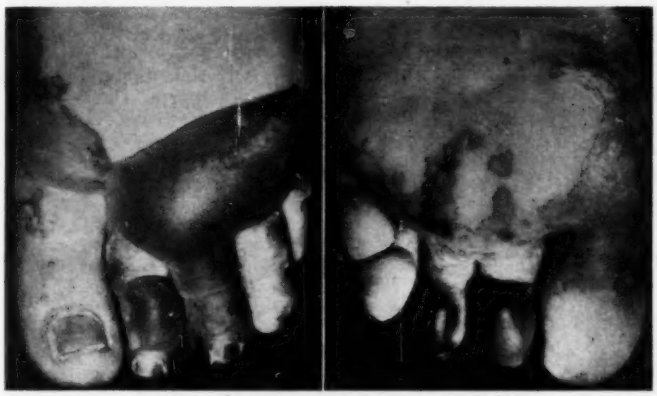
Fig. 3—Case 3: staged development of massive thrombophlebitis has given rise to gangrene in terminal parts of second and third toes.

From the time when the left thigh was involved in hospital she was treated with anticoagulants, but in spite of this she had further attacks of phlebitis. At no time, however, was she shocked. Physiotherapy was begun when swelling had considerably subsided, dilated veins having developed around the root of the thigh and on the lower abdomen. The necrotic areas of the toes were allowed to separate spontaneously.

Case 4.—A woman, aged 38, was admitted urgently to hospital, where on laparotomy a ruptured cystadenocarcinoma of the ovary with widespread pelvic metastasis was found. Immediately after the operation her right calf swelled, with pain on dorsiflexion of the foot and tenderness of the calf and the popliteal fossa.

12 days after the operation she complained of a sharp pain in the right chest and was found to have œdema of the left leg up to the groin. Anticoagulant therapy was started and morphine prescribed. She had bloodstained sputum 24 hours later and two further episodes of acute pain in the right chest, after which these symptoms improved. 8 days after the initial swelling of the left leg, however, there was a sudden increase in œdema with severe pain and cyanosis of the whole limb. Anticoagulants were continued, and, when she was seen 6 days after this episode, there were hæmorrhagic blebs on the dorsum of the foot with gangrene of the second and third toes (fig. 4); ankle pulses were palpable. Anticoagulants were stopped, and mobilisation was encouraged.

The patient's general condition slowly improved in the next few weeks, before ascites and a rapidly advancing



(a) (b)

Fig. 4—Case 4: dorsal (a) and plantar (b) aspects of foot involved by massive thrombophlebitis.

cachexia became obvious. She was allowed home, where she died of widespread metastatic disease 4 months after laparotomy. No necropsy was performed.

Case 5.—A man, aged 67, had been losing weight and feeling weak for 3 months. A recent pneumonia had caused his doctor to suspect carcinoma of the bronchus. On the morning of admission to hospital the patient awoke to find his right leg swollen (fig. 5). It continued to swell, felt very heavy, and was blue when he was admitted to hospital 7 hours after the first symptoms. At no time did he feel any pain.

On examination the limb was swollen from the toes to the lower abdomen and deep blue, with multiple petechial hæmorrhages (fig. 6), particularly involving the thigh. The œdema was hard, but ankle pulses were still palpable. The terminal phalanges of the toes were hypoæsthetic. The patient was generally wasted, and several hard glands were palpable in the lower part of his neck. 30 minutes after admission his pulse-rate was 140 and systolic blood-pressure 70 mm. Hg. An intravenous drip was immediately set up, and within 7 hours he had received two pints of blood and five pints of glucose-saline solution. Simultaneously vigorous passive exercise of the whole leg, which was kept raised, was begun and continued for the first 12 hours in hospital. The patient's general improvement was considerable, and the œdema of the leg began to soften.

2 days later his entire left leg became blue and began to swell; his pulse-rate rose and his blood-pressure again fell. Intravenous fluids and elevation and exercise for this limb were started and produced immediate improvement. No anticoagulants were used during either episode.

Radiography revealed massive secondary deposits in the chest, bloody stools were passed, and the patient went steadily downhill to die of cachexia 4 weeks after admission. Necropsy showed a primary stenotic carcinoma of the pelvic colon with gross secondary carcinomatosis of his liver and lungs. The inferior vena cava below the renal veins and all the pelvic veins were occluded by thrombus as far distally as the metatarsal veins.

Discussion

The symptoms of massive thrombophlebitis in a leg result from venous occlusion sufficient to cause nearly complete arrest of capillary blood-flow. This may occur as a solitary dramatic episode (e.g., cases 1 and 5) or as a result of a series of attacks of thrombophlebitis over a matter of days or even hours (e.g., cases 2–4). The veins involved by the occlusion may be predominantly those carrying blood out of the limb at its root, the small radicles at the periphery (Haimovici 1950), or both groups of vessels. In whatever way this massive thrombophlebitis develops, the blood-flow through the capillary bed is eventualy reduced, while the arterial input continues to congest the tissues.

Another consequence of the high capillary pressure is a considerable rise of capillary filtration, which leads to rapidly developing œdema. The loss of circulating blood volume both in the congested vessels and by œdema fluid may be sufficient to produce fatal oligæmic shock (e.g., case 1).

If after massive thrombophlebitis ischæmia lasts long enough, gangrene results. This is generally moist but occasionally dry (Haimovici 1950); it varies in extent and usually involves the distal part of the foot. Gangrene of the thigh, however, has been described (Hershey and Snyder 1953).

The ætiology of massive thrombophlebitis seems to be similar to that of the less extensive form (white leg, phlegmasia alba dolens). Massive phlebitis in the leg is often associated with inflammation or neoplastic disease of the pelvis, and this was so in all the present cases. Nevertheless it has been known to develop in an apparently healthy young man (Halligan et al. 1953).

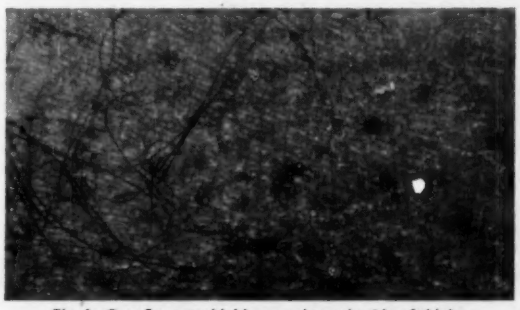


Fig. 6—Case 5: petechial hæmorrhages in skin of thigh.

The sexes are equally involved, and no age-group seems to be immune.

The symptoms resolve as unoccluded venous channels dilate: the intense congestion remits, and œdema fluid is slowly absorbed. Often masses of small anastomotic veins become visible in the skin of the limb and lower abdomen, depending on the extent of the original occlusion.

There is little difficulty in making a correct diagnosis when a clinical history or actual observation has indicated recurring thrombophlebitis. Eventually, as in case 3, one such episode, by further occluding an already impaired venous system, is sufficient to cause tissue ischæmia with its sequelæ of pain and gangrene. Further swelling and deep cyanosis are characteristic. The area involved is usually well localised, often to the end of the limb.

It is, however, the single dramatic episode of massive thrombophlebitis which gives rise to difficulty, acute ischæmia of

Fig. 5—Case 5: right leg after onset of massive thrombophlebitis.

DIFFERENTIAL DIAGNOSIS OF ARTERIAL OCCLUSION AND MASSIVE THROMBOPHLEBITIS IN THE LEG

Arterial Occlusion	*Massive Thrombophlebitis*
1. Little, if any, shock.	Severe shock may be present or incipient.
2. Involvement of distal part of the limb even with proximal occlusion.	Generally whole limb, often with the lower abdomen, involved.
3. Œdema absent initially, and any late development is of minor degree.	Œdema develops with dramatic rapidity and usually involves the whole limb.
4. Waxy yellow colour or mottled cyanosis paling on elevation.	Whole limb to groin dusky purple persisting on elevation.
5. Subcutaneous veins, poorly filled, "gutter" on elevation.	Subcutaneous veins, turgid with blood, do not empty on elevation.
6. No skin hæmorrhages.	Petechial or more severe hæmorrhages.
7. Subpapillary veins do not fill after pressure.	Rapid refilling of subpapillary veins after pressure.
8. No pulses and no oscillometric evidence of arterial pulsation present below occlusion.	Pulses may be absent. Oscillations usually less than in normal limb.
9. Pain usually not severe.	Pain may be agonising.
10. Any loss of movement is due to ischæmia.	Any loss of movement is generally due to pain.
11. Hyperæsthesia, hypoæsthesia, and anæsthesia may occur.	Hyperæsthesia, hypoæsthesia, and anæsthesia may occur.

arterial origin often being diagnosed in error (see table). It may therefore be helpful to describe the symptoms and signs of massive thrombophlebitis and later to compare them with those resulting from acute arterial occlusion.

The patient, while in bed or going about his normal activities, develops a severe pain in his leg, beginning in the upper thigh (Haimovici 1950) and rapidly extending downwards to reach agonising proportions within an hour. Less often the pain begins in the region of the knee and spreads up and down. Initially of an intense burning or paræsthetic nature, it prohibits either active or passive movement. Almost coincidentally the limb takes on a dusky cyanotic appearance from the groin distally, petechial hæmorrhages may appear, and swelling begins, sometimes involving the lower abdominal wall. As this congestion and œdema progress, compensation for loss of circulating blood volume may fail, with a rise of pulse-rate and fall of blood-pressure; locally the skin appears tight and shiny with the changes of *peau d'orange*, and the superficial veins are distended. The patient complains of a deep aching or bursting sensation in the limb.

On examination the skin may be hyperæsthetic, hypoæsthetic, or patchily anæsthetic, especially in the most deeply cyanotic areas; it blanches only with the firmest pressure and rapidly congests again. If subcutaneous veins can be massaged empty, it is only with difficulty—they may be thrombosed. Skin-temperature is usually lowered, to a greater extent peripherally, and this is exaggerated by any associated circulatory collapse. Raising the limb does not affect the colour or the degree of venous filling. Deep muscular tenderness in the foot, calf, and thigh is usual, but for the first 24 hours tenderness over the major veins is rarely elicited; after that time, however, it becomes severe. Initially, peripheral pulses may be felt even though they are relatively less than those of the opposite leg; later, œdema and any peripheral vascular collapse make their palpation very difficult. Oscillometry usually indicates continued arterial pulsation.

The rôle of associated arteriospasm in this condition is disputed. Many (e.g., Veal et al. 1951, Turner 1952, Hershey and Snyder 1953) think that, if arterial spasm occurs—and it is recognised that it may occur reflexly in thrombophlebitis (Ochsner and DeBakey 1940)—the part it plays in causing the symptoms is not great. Others (Janes and Hopmans 1953, Martin 1953) regard arteriospasm as a sinister complication. Certainly Burch et al. (1939) have shown experimentally that occlusion of the venous return from a limb can reduce oscillometric readings by more than half. However, the absence of palpable peripheral pulses in massive thrombophlebitis may be due to previous atherosclerotic occlusive disease, the masking effect of œdema, or associated peripheral circulatory failure quite apart from spasm.

Provided the threatened circulatory collapse is avoided or suitably treated, the dilatation of anastomotic venous channels during the succeeding days leads to a slow resolution of the œdema; blood-flow improves, pain passes, cyanosis fades, petechial hæmorrhages are absorbed, and any resulting necrosis begins to demarcate. Massive gangrene is unusual, and part of the foot or only the toes may slough. Though this sequence is typical, pain is by no means constant and may be absent (e.g., case 5). So far as the development of gangrene is concerned, absence of pain seems to be a good prognostic omen. Absence of pain, however, does not preclude the onset of severe, even fatal, circulatory collapse (case 5).

Immediately after the attack of massive thrombophlebitis, phlebitis of the opposite limb is quite possible (cases 1, 3, and 5), particularly when clot fills a common iliac vein. There is also the risk of an occult phlebothrombotic process developing with subsequent pulmonary embolism. From the small number of previously published cases this certainly seems to be rare.

To summarise then, the clinical features of massive thrombophlebitis are those associated with a degree of vascular turgidity sufficient to arrest the circulation; they usually overlie some other systemic disorder.

Almost the contrary is true for the syndrome of acute arterial occlusion. While embolism most commonly results from cardiac disease, and arterial thrombosis from severe atherosclerosis, the ischæmic limb in these conditions presents a picture of severe deprivation of blood. Unless there is aortic thrombosis or a dissecting aneurysm (in which cases both legs will be involved), early pain is not a prominent feature, there is no severe shock, and life is not immediately endangered. Even when the common iliac artery is occluded, it is rare for the whole limb to show ischæmic change as high as the inguinal ligament. Thus, after occlusion of the external iliac artery, ischæmia reaches about mid-thigh level; after occlusion of the superficial femoral artery it reaches to just below the knee-joint, and after occlusion of the popliteal artery it reaches to about the ankle-joint. This contrasts with the extensiveness of the fulminating attack of massive thrombophlebitis.

Pain immediately after arterial obstruction is rarely severe and never has a bursting character, but paræsthesiæ and heaviness are not unusual. Œdema does not develop immediately, and if it does occur in the "twilight" area of relative ischæmia it is slight. As regards skin-colour changes, there may be uniform cyanosis of the ischæmic part, a waxy yellow pallor, or a patchy mixture of the two colours; slight pressure, however, blanches the skin, which remains pale. Petechial hæmorrhages do not occur. Raising the limb produces or exaggerates the pallor and "gutters" the veins. Areas of hypoæsthesia and anæsthesia are found, usually involving almost the whole of the ischæmic zone. It may be easy to localise the site of arterial obstruction by simple palpation; otherwise oscillometry may be used. The slight tenderness of a thrombosed artery, developing one or two days after the occlusive episode, is considerably less than that of the corresponding venous lesion. Active or passive movement is rarely precluded by pain, but necrosis of muscle groups does

sometimes give rise to tenderness and contracture, particularly in the calf. Loss of movement of the toes and ankle-joint rarely occurs from occlusion below the level of the superficial femoral artery, and any gangrene resulting tends to be more extensive than that following massive thrombophlebitis.

The salient differences between the two conditions therefore lie in the extent of the changes, the colour of the skin, the type and severity of the pain, and the development of œdema with its risk of secondary circulatory collapse. Diagnosis should then be clinical; arteriography (Moore and Scott 1956) can hardly have a place when the serious general condition of these patients is considered.

The changes which develop in phlegmasia alba dolens (iliofemoral thrombophlebitis, white leg) are altogether milder but may be precursors of the more extensive disease. The upper limb has sometimes been involved by the process (Mills and Bennetts 1955), but not all published cases (Pringle 1938) attributed to massive thrombophlebitis are altogether convincing; certainly it is uncommon in this site.

Moser et al. (1954) state that gangrene develops in at least half the limbs involved by massive thrombophlebitis, and that a quarter of the patients die. This latter figure seems one which should be capable of considerable reduction. The most important aspect of treatment is the anticipation of circulatory collapse. Whole blood is lost from the circulatory volume into the limb, and what little escapes from it is hæmoconcentrated by the loss of much œdema fluid. A large volume of saline solution, plasma or plasma substitute, and blood is likely to be required within the first 12 hours of the onset of the condition. Delay can be fatal for the patient. This, of course, applies to the fulminating attack; the staged development of massive thrombophlebitis, being much more gradual, does not overtax the circulatory system, and transfusion is not likely to be necessary.

When general resuscitative treatment is under way, treatment of the limb can begin. Perhaps the most rational measure is to remove as much clot as possible from the femoral and iliac vessels. This has been done successfully by DeBakey and Ochsner (1949), Miles (1951), and Ellis and Windham (1952), but Miles (1951) attributed his success to associated ligation of the inferior vena cava, a manœuvre which has been reported to initiate the condition (Veal et al. 1951). However, many patients with massive thrombophlebitis are in no condition for surgical intervention, the results of which are at best likely to be doubtful.

The rôle of arteriospasm has been considered above. Those who are impressed by the possibility of it advocate the use of sympathetic blocks, spinal anæsthesia, vasodilators (Haimovici 1950, Halligan et al. 1953, Janes and Hopmans 1953), and heavy sedation (Martin 1953). Others (Ebel et al. 1952, Turner 1952), finding that none of these treatments affected pain, œdema, or ischæmia, regard them as useless.

Is it reasonable to induce vasodilation? If the very doubtful entity of venospasm actually is a factor in the genesis of the condition (Manheimer and Levin 1954), its relaxation is obviously desirable. To induce any arterial dilation, however, seems equally undesirable; there is already a surfeit of blood in the affected limb, and to increase this seems likely to make matters worse. It is therefore suggested that the initial use of paravertebral blocks and vasodilators is illogical and should be avoided (Ebel et al. 1952).

A further question which arises is the indication for anticoagulant therapy. It has been pointed out that capillary pressure is not infrequently high enough to give rise to petechial hæmorrhages (DeBakey and Ochsner 1949, Veal et al. 1951, Manheimer and Levin 1954). In the acute phase any increase of the clotting-time is obviously liable to worsen this tendency and possibly further to embarrass the circulation by increasing tissue tension. In one case (not reported here) where anticoagulant therapy had been energetically pursued the entire skin area below the knee contained extravasated blood. Since, therefore, anticoagulant therapy increases the liability to gangrene or its extension in the initial stages of massive thrombophlebitis it should not be used (Veal et al. 1951). When, however, venous collaterals have begun to open up and symptoms subside, there may be a place for such therapy because the risk of further intravascular clotting in the same limb or elsewhere remains. Even so consideration will have to be given to the risk of hæmorrhage from any other associated pathology.

It is obviously desirable to aid drainage of blood from the congested limb, and its elevation is certainly indicated. Veal et al. (1951) advocated vigorous exercise in an attempt to pump blood out of the limb. This advice has been followed satisfactorily by Moser et al. (1954) and was applied in case 5, when almost continuous active and passive movement of the leg was kept up for twelve hours. This patient never gave any anxiety as to the leg becoming gangrenous, but it is felt that the exercise and vigorous intravenous therapy enabled him to recover from his peripheral circulatory collapse. This régime initiated by Veal et al. (1951) is therefore recommended in the treatment of massive thrombophlebitis, but in many cases it will have to be given after analgesics have been given to the patient. The possibility that such treatment may give rise to pulmonary embolism has been raised (Mills and Bennetts 1955), but there seems to be little risk of this (*Lancet* 1955). The patient should be encouraged to move about in bed to reduce the risk of chest and other complications. The heavy sedation which has been advised (Martin 1953) seems to have little to recommend it.

Limbs incipiently gangrenous should be kept in an environmental temperature of 20°–25°C (68–77°F) because the tissue demand for oxygen will be reduced without the vasoconstriction due to cold resulting (Catchpole and Jepson 1955).

As soon as swelling has begun to subside and the patient's general condition is satisfactory, he may be allowed up with the limb well supported. Although it has been noted (DeBakey and Ochsner 1949), and I have personally observed, that resolution may appear virtually complete, more commonly the typical indurated post-phlebitic leg results. Gangrenous tissue should be allowed to separate and any precipitous amputation avoided because necrosis may be no more than skin-deep.

Whilst awaiting this development, the patient must be investigated to disclose any underlying disease which has predisposed to the attack of phlebitis.

Summary

Five cases of massive thrombophlebitis (massive venous thrombosis, phlegmasia cærulea dolens) are described.

The rarity of the condition has undoubtedly been over-emphasised, with the result that it is often tardily diagnosed and inadequately treated.

The pathology of the condition has been briefly outlined and the diagnosis and clinical course discussed.

The urgent need for vigorous treatment early in the fulminating type of the disease to prevent or overcome shock and to avert a speedy death is emphasised.

Attempts to induce vasodilation are contra-indicated, and initial anticoagulant therapy should be avoided.

Exercise is advocated to pump blood from the congested tissues, if it is not feasible to remove the offending blood-clot surgically.

Any tissue necrosis which results should be treated with conservatism.

I should like to thank Dr. E. G. Rhind for permission to examine his patient and publish her case-report (case 3). I am grateful to Prof. R. P. Jepson for much encouragement in the study of this disease.

REFERENCES

Burch, G. E., DeBakey, M., Sodeman, W. A. (1939) *Proc. Soc. exp. Biol., N.Y.* **42**, 858.
Catchpole, B. N., Jepson, R. P. (1955) *Clin. Sci.* **14**, 109.
DeBakey, M., Ochsner, A. (1949) *Surgery*, **26**, 16.
Ebel, A., Kaufman, M., Ehrenreich, T. (1952) *Arch. intern. Med.* **90**, 402.
Ellis, J. T., Windham, S. W. (1952) *Ann. Surg.* **135**, 262.
Haimovici, H. (1950) *Circulation*, **1**, 225.
Halligan, E. J., Costello, J. L., Lewis, T. F. (1953) *Ann. Surg.* **137**, 543.
Hershey, C. D., Snyder, R. E. (1953) *Surgery*, **34**, 296.
Janes, E. C., Hopmans, C. C. (1953) *Canad. med. Ass. J.* **68**, 156.
Lancet (1955) ii, 1376.
Manheimer, L. H., Levin, L. M. (1954) *Angiology*, **5**, 472.
Martin, P. (1953) *Brit. med. J.* ii, 1351.
Miles, R. M. (1951) *Surgery*, **30**, 718.
Mills, E. S., Bennetts, R. C. (1955) *Canad. med. Ass. J.* **72**, 917.
Moore, R. F., Scott, G. B. D. (1956) *Brit. J. Surg.* **43**, 591.
Moser, M., Babin, S. M., Cotts, G. W., Prandoni, A. G. (1954) *Ann. intern. Med.* **40**, 361.
Ochsner, A., DeBakey, M. (1940) *J. Amer. med. Ass.* **114**, 117.
Pringle, J. H. (1938) *Glasg. med. J.* **129**, 126.
Turner, D. P. B. (1952) *Brit. med. J.* ii, 1183.
Veal, J. R., Dugan, T. J., Jamison, W. L., Bauersfeld, R. S. (1951) *Surgery*, **29**, 355.

INDUCTION OF LABOUR TO PREVENT RECURRENT STILLBIRTH DUE TO HÆMOLYTIC DISEASE

WILLIAM WALKER
M.D. Durh.
SENIOR LECTURER IN CHILD HEALTH, UNIVERSITY OF DURHAM

SHEILAGH MURRAY
M.D. Durh.
DIRECTOR, BLOOD TRANSFUSION SERVICE, NEWCASTLE UPON TYNE

J. K. RUSSELL
M.D. Aberd., M.R.C.O.G.
SENIOR LECTURER IN OBSTETRICS, UNIVERSITY OF DURHAM

WHEN more than 95% of mature liveborn babies with hæmolytic disease can survive (Diamond et al. 1950, Walker and Murray 1954) there is little indication for induction of labour before term unless it may prevent stillbirth. The over-all risk of stillbirth in hæmolytic disease is 15%, but varies from 2% following mild disease in the previous pregnancy to 80% following multiple stillbirths (Walker and Murray 1956).

With the coöperation of colleagues throughout the Newcastle region, we have in the past three years made a trial of premature induction in families with a high risk of stillbirth—i.e., those in which a previous stillbirth has been due to hæmolytic disease and in which the father is homozygous D/D.

Management

Clinical and radiological assessment was carried out at the 34th week of pregnancy. If the fœtus was alive and not hydropic, labour was induced 35 days before the expected date of delivery. During the first year of the trial induction was started by rupturing the hind waters with a Drew Smythe catheter, and, if labour did not begin within forty-eight hours, an intravenous oxytocin drip, as described by Theobald et al. (1948), was given. In the next two years an oxytocin drip for forty-eight hours was given, followed if necessary by rupture of the membranes. If labour did not begin within forty-eight hours, a second oxytocin drip was given. In all cases where the membranes had been ruptured for more than forty-eight hours, the patient received streptomycin 1 g. daily and sulphadimidine 1 g. six-hourly.

Using this induction routine, 21 babies were delivered per vaginam using Wrigley's forceps. Another 4 babies were delivered by cæsarean section—1 because of fœtal distress before the onset of labour, the others because of failure to initiate delivery. All 25 were delivered between thirty-five and twenty-five days before the expected date of delivery.

TABLE I—RESULTS IN 108 CASES WITH PREVIOUS STILLBIRTH

			Rh-positive cases				Rh-negative cases	All cases
			No.	Stillbirths	Hæmolytic disease: Severe	Hæmolytic disease: Mild		
Not induced	Cause of previous stillbirth unknown		14	3 (21%)	7	4	1	15
	"Spontaneous"	Father heterozygous	13	9 (69%)	4	Nil	14	27
		Missed	6	5 (83%)	1	Nil	Nil	6
Induced			60	37 (62%)	23	Nil	Nil	60
Total			93				15	108

Results

During the three years, 102 women were seen, early in pregnancy, who had previously had a stillbirth possibly attributable to hæmolytic disease. 48, however, were not selected for induction—in 27 because the father was heterozygous D/d, and in 15 because the stillbirth, after careful review of the history, was not regarded as due to hæmolytic disease. 6 additional cases were not recognised until admitted in labour. The general results in all 108 cases are shown in table I.

Where the previous stillbirth was not due to hæmolytic disease the severity of the infant's illness was what we should expect in unselected material (Walker and Murray 1954), and only 1 of the 3 stillbirths was a classical hydrops fœtalis.

The Rh-positive babies of heterozygous fathers show the high proportion of stillbirths expected, and all those born alive were severely affected. If we add to this group the 6 Rh-positive babies detected too late for induction, the incidence of stillbirth in "spontaneous" cases is 73%. In the cases selected for induction, the incidence of stillbirth is only a little less (62%), largely because 27 of the 37 stillbirths were at less than 35 weeks. However, only 3 of the 19 "spontaneous" cases (against 24 of the 60 "induced" cases) were preceded by more than 1 stillbirth due to hæmolytic disease; and, since multiple stillbirths carry a worse prognosis, this would tend to make induction look less valuable than it is. Table II

TABLE II—RESULT IN RELATION TO NUMBER OF PREVIOUS STILLBIRTHS AND STAGE OF GESTATION

Stage of gestation (weeks)	1 previous stillbirth		More than 1 previous stillbirth		Total	
	Stillborn	Liveborn	Stillborn	Liveborn	Stillborn	Liveborn
Before 28 ..	3	..	1	..	4	..
28–32	3	..	7	..	10	..
33–35	5	..	8	..	13	..
36–37	5	17	2	6	7	23
After 37 ..	2	..	..	..	2	..
Total	18	17	18	6	36	23
Not recorded ..	1	..	..	..	1	..
Total ..	36		24		60	

shows the duration and result of pregnancy in relation to the number of preceding stillbirths.

We expected 30% of live births when there had been one previous stillbirth, but we found 50%; when there had been multiple stillbirths we expected 20% and found 25%. The results were better in the first group, essentially because 68% reached 35 weeks' gestation, whereas in the second group only 35% did so. The time of fœtal death does not necessarily correspond with delivery, and we should mention that, though only 45% of the babies in the trial cases were stillborn by 35 weeks' gestation, 55% were already dead. If, however, a pregnancy did reach 35 weeks satisfactorily, the prospect of bringing about a live birth was about the same whether there had been 1 stillbirth or more than 1—i.e., 17:24 and 6:8 respectively.

We have, therefore, without subdivision as to number of previous stillbirths, compared the "induced" and "spontaneous" cases which reached 35 weeks' gestation (table III).

These findings are significantly in favour of premature induction ($P = 0.02$—0.01), in spite of including 7 in the

TABLE III—RESULTS IN PREGNANCIES REACHING 35 WEEKS' GESTATION

—	Live birth	Stillbirth	Total
Induced ..	23	9	32
Spontaneous ..	5	10	15
Total ..	28	19	47

induced group, and only 3 in the spontaneous group, who were already dead or hydropic at 35 weeks. If these cases are excluded a truer evaluation of premature induction can be made (table IV).

This difference is highly significant and in favour of premature induction ($P = 0.004$).

We conclude that if there has been a previous stillbirth due to hæmolytic disease, and a subsequent Rh-positive fœtus reaches 35 weeks' gestation, alive and not hydropic on X-ray examination, premature induction at this stage gives a better chance of live birth than does spontaneous delivery.

The prospect of live birth is high (probably more than 80%), but one must remember that the nearer a pregnancy approaches term successfully, the greater is the chance of spontaneous live birth. Therefore the longer premature induction is delayed, the better will the results appear if early stillbirths are ignored.

The importance of the Rh genotype of the father was recognised only late in the trial, and retrospectively it was seen that, of the three common genotypes homozygous for D, the prospect of reaching 35 weeks' gestation was poorer if the father was cDE/cDE (R_2R_2) (Murray 1956).

The Severity of Disease in "Induced" Liveborn Babies

Relatively severe disease is to be expected in any liveborn baby if a previous sibling was stillborn with hæmolytic disease. In this series all the premature babies were severely affected and 5 out of 23 died. In the figure we have shown the distribution of birth-weight, cord hæmoglobin, and bilirubin values.

Birth-weights varied from $3^1/_2$ to 7 lb., but 40% were between 5 and 6 lb. and this distribution corresponds closely to the expected weight-distribution in babies of any parous women at $35^1/_2$ weeks' gestation (Walker, J. 1955).

The average cord-hæmoglobin value was 68% (10 g. per 100 ml.); this should be compared with an average of 94% (14 g. per 100 ml.) for all cases of hæmolytic disease, in which only 48% have less than 100% (14·8 g. per 100 ml.). In 90% of the induced cases the level was below this.

TABLE IV—RESULTS IN PREGNANCIES REACHING 35 WEEKS' GESTATION WITH A LIVING AND NOT HYDROPIC FŒTUS

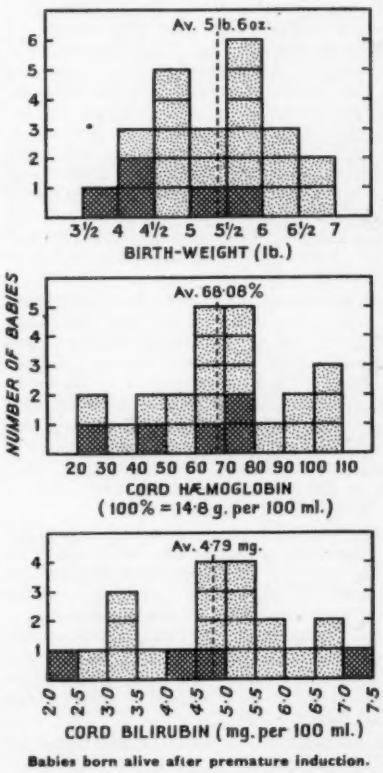
—	Live birth	Stillbirth	Total
Induced ..	23	2	25
Spontaneous ..	5	7	12
Total ..	28	9	37

The cord-bilirubin values also confirm the severity of the disease in the induced cases. Of these nearly 50% had values higher than 5 mg. per 100 ml., compared with 20% of the whole series.

Treatment and Mortality

Babies were selected for treatment on the basis of cord hæmoglobin and bilirubin values, relying on the criteria we have used since 1951 (Walker 1953). All required early exchange transfusion, and were treated in the way already described (Walker and Neligan 1955) except that, in the light of early experience with "induced" babies, we decided to take into account the baby's cord-hæmoglobin value and were content with transfusion of smaller amounts—as little as 40 ml. per lb. in one or two very anæmic babies.

We have taken as our criterion for repeating exchange transfusion a bilirubin level of 25 mg. per 100 ml. during the first 6 days of life. 9 out of 18 survivors required multiple exchange transfusion compared to 13 (5%) of 255 other infants with hæmolytic disease who were treated by exchange transfusion during the same period. None of the "spontaneous" group became so deeply jaundiced as to require repeated exchange transfusion. There was no absolute correlation between the need for repeating exchange transfusion and birth-weight, cord hæmoglobin or bilirubin levels, or the age at which the first exchange transfusion was performed.



Babies born alive after premature induction.

The other major difference between the "induced" and "spontaneous" cases is in regard to mortality. All 5 spontaneous liveborn babies survived, despite severe disease. In contrast 5 of 23 "induced" babies died. 4 died in the course of exchange transfusion—an event which is extremely rare, even in very severely affected babies, if they are born near term. These deaths, which are not fully explained, took place without warning but after an appreciable amount of

blood had been exchanged. The baby, often well and improving since the start of transfusion, became cyanosed; the venous pressure was suddenly raised; respiration became gasping and irregular; the heart had already stopped; and resuscitation was impossible. Necropsy supplied no direct explanation, though in all cases important contributory features associated with prematurity or premature induction were found—e.g., 2 babies had severe pneumonia, and 3 had pronounced cardiomegaly, while tentorial tears, hyaline membranes, or pulmonary hypoplasia were present in some cases. Recently in 2 cases not included in this report, labour was induced before term for obstetrical reasons. Neither baby was very severely affected, yet both died during exchange transfusion.

Discussion

Stillbirth remains the outstanding problem of hæmolytic disease. The stillbirth-rate in our material is 16%, which corresponds with other recent estimates (Davies et al. 1953, Allen et al. 1954), but the risk in a family is higher when there has been a previous stillbirth from this cause (Allen et al. 1954, Walker and Murray 1956).

In considering a policy of induction before term, one must set the greater risk of neonatal death against the greater chance of live birth (Mollison and Walker 1952, Armitage and Mollison 1953, Allen et al. 1954). Kelsall and Vos (1955) recommended induction at 36 weeks' gestation for most cases of Rh-isoimmunisation, but we do not think their figures justify the claim that nearly all stillbirths could thereby be prevented. Dundon et al. (1952) similarly estimated that there would be very few stillbirths if all babies alive at 36 weeks' gestation were delivered then, but other workers have been less optimistic. Obviously the efficacy of induction depends on the time at which it is done and the time at which intrauterine death occurs. Davies et al. (1953) held that induction at 35 weeks would prevent 75% of stillbirths, but Allen et al. (1954) concluded that only 28% would be avoided by delivery at $36\frac{1}{2}$ weeks. Our experience is more in line with this latter view, but in addition we have found that the chance of successfully reaching an advanced stage of gestation can be related to the family history. We calculate that induction at 35 weeks can possibly prevent 50% of all hæmolytic stillbirths, but the proportion falls below 30% if hæmolytic disease has caused more than one previous stillbirth. The stage of gestation reached in an earlier pregnancy is not an accurate guide to what may be expected in the present one; nor, in our experience, is it satisfactory to be guided by fœtal activity.

On the evidence presented, we believe that premature induction is indicated in families where there has been a preceding stillbirth due to hæmolytic disease, and should be considered where there has been a previous "very severely affected" baby. Induction at 35 weeks carries a good chance of initiating prompt delivery, and the degree of prematurity does not in itself carry a bad prognosis. In families where two or more previous babies have been stillborn or very severely affected, one should consider delivery at 32 weeks—at which time elective cæsarean section will probably be indicated.

If induction is performed because of a bad obstetrical history, severe disease in a premature baby must be expected and arrangements must be made for prompt (and in many cases repeated) exchange transfusion. Some premature babies tolerate exchange transfusion badly, and we have found it expedient to do this in two stages, each taking half an hour with an interval of half to one hour between. In deciding the volume of blood to be transfused we take account of the relative hæmoglobin values of baby and donor.

Absolute rules cannot be laid down satisfactorily for the conduct of all cases.

Summary

Between July, 1952, and July, 1955, induction of labour at 35 weeks' gestation was considered in 102 families in which a previous stillbirth had been attributed to hæmolytic disease.

60 were selected for induction because the preceding stillbirth was undoubtedly due to hæmolytic disease and because the father was homozygous D/D.

Only 25 of the 60 reached 35 weeks with a living fœtus apparently normal on X-ray examination; all were induced at this stage.

23 liveborn babies resulted; and, though all were severely affected by hæmolytic disease, 18 survived.

Attention is drawn to the fact that many stillbirths from hæmolytic disease occur early in pregnancy and that the premature baby with hæmolytic disease presents a difficult problem of treatment.

Again we are indebted to our colleagues in obstetrics, pædiatrics, and pathology throughout the Newcastle region and to the staff of the Newcastle Maternity Units and National Blood Transfusion Service. We thank especially Dr. George Anderson and Dr. T. D. Davies for their help and interest.

REFERENCES

Allen, F. H. jun., Diamond, L. K., Jones, A. R. (1954) *New Engl. J. Med.* **251**, 453.
Armitage, P., Mollison, P. L. (1953) *J. Obstet. Gynæc., Brit. Emp.* **60**, 605.
Davies, B. S., Gerrard, J., Waterhouse, J. A. H. (1953) *Arch. Dis. Childh.* **28**, 466.
Diamond, L. K., Allen, F. H. jun., Vaughan, V. C. (1950) *Amer. J. Dis. Child.* **80**, 779.
Dundon, S., O'Driscoll, K., Geoghegan, F. (1952) *J. Irish med. Ass.* **30**, 35.
Kelsall, G. A., Vos, G. H. (1955) *Lancet*, ii, 161.
Mollison, P. L., Walker, W. (1952) *Ibid*, i, 429.
Murray, S. (1956) *Brit. J. Hæmatol.* (in the press).
Theobald, G. W., Graham, A., Campbell, J., Gange, P. D., Driscoll, W. J. (1948) *Brit. med. J.* ii, 123.
Walker, James (1955) Personal communication.
Walker, W. (1953) *Arch. Dis. Childh.* **28**, 246.
— Murray, S. (1954) *Brit. med. J.* ii, 126.
— — (1956) *Ibid*, i, 187.
— Nelligan, G. A. (1955) *Ibid*, i, 681.

THE CORRELATION BETWEEN URINARY ŒSTROGEN AND VAGINAL CYTOLOGY

STRETTON YOUNG
M.B. St. And.

R. D. BULBROOK
M.Sc., Ph.D. Lond.

F. C. GREENWOOD
M.Sc., Ph.D. Lond.

From the Clinicopathological Laboratories, Imperial Cancer Research Fund, Royal College of Surgeons of England

IT is very desirable that the treatment of metastatic breast cancer by the administration of hormones or by ablation of endocrine organs should be controlled and rationalised by repeated assessment of the hormonal status of the patient. For this purpose the first essential is to investigate the formation and utilisation of the œstrogenic steroid hormones, with the object of gaining knowledge of ovarian and adrenal cortical function. In this connection it would be of inestimable value if it were possible to determine the œstrogen content of the circulating blood. Until a reliable method applicable to the human cancer patient becomes available, we must be content with the chemical estimation of the œstrogens and their excretion products in the urine, together with a determination of the presence or absence of œstrogen stimulation of the secondary sex organs, judged by cytological examination of the vaginal fluid.

A reasonably accurate biochemical method elaborated in the Medical Research Council's endocrinological unit in the University of Edinburgh (Brown 1955) measures the urinary output of œstrogens in three fractions—œstrone, œstradiol-17β, and œstriol. The method is too elaborate and costly for routine clinical use, but its accuracy recommends it as a research method; and,

once it has been standardised in a well-equipped laboratory, many estimations can be undertaken by a trained technical staff.

Unless supported by significant biological correlation, the chemical estimation of excreted œstrogens gives no precise information about the production and utilisation of œstrogens in the body. We report here an attempt to determine the correlation between the level of œstrogens in the urine and the degree of œstrogen stimulation of the vaginal mucosa, as judged by vaginal cytology. The observations were made in 53 premenopausal and postmenopausal women, whose ages ranged from 26 to 80 years: the majority were postmenopausal, and some of them had mammary cancer.

Methods

Vaginal Cytology

Vaginal fluid was taken from the posterior fornix, 75 specimens being obtained from the 53 women.

Several methods have been proposed for recording the cellular pattern of the vaginal fluid. Except in the technique proposed by Mack, a fixed film of the stained fluid is graded according to the intensity of the œstrogenic stimulation, judged by the predominant cell type. The fluid from an unstimulated mucosa shows "deep" cells only; if the mucosa is moderately stimulated, "intermediate" cells predominate; and if it is powerfully stimulated most of the cells are "superficial" and many are cornified. The grading may be assessed by simple inspection (Graham 1950) or by estimating glycogen-containing cells; for this purpose the glycogen may be stained by iodine vapour (Mack 1943) or by other methods such as Best's carmine after wet fixation in alcohol-ether. A differential count may be made; we have done this by counting 500 cells in each preparation, each group of 100 cells being taken from a different area of the film. a chess-board graticule was used in one eyepiece and a measuring graticule in the other. The frequency of five cell types was recorded.

By the differential count three indices were calculated:

(1) *Deep index* (percentage of deep cells).

(2) *Pyknotic index* (percentage of superficial cells, both cornified and uncornified).

(3) *Cornified index* (percentage of cornified superficial and intermediate).

Again by the differential count smears were assigned to the following groups or grades cited by Kasdon (1953):

Grade O.—No œstrogen effect; deep cells only.

Grade I.—Very slight œstrogen effect; 25% deep cells with 75% intermediate cells.

Grade II.—Slight œstrogen effect; almost all cells intermediate.

Grade III.—Moderate œstrogen effect; 75% intermediate, superficial cells approaching 25%.

Grade IV.—Considerable œstrogen effect; 75% or more superficial.

Our routine technique was to collect the vaginal specimen on the same day that a 24-hour specimen of urine was being obtained. Several films of each vaginal fluid were prepared on slides immediately after collection. These were appropriately fixed and stained, and the vaginal fluid from each patient was cytologically graded according to the following criteria:

(1) Into one of five grades by simple inspection (Graham 1950).

(2) Into one of four grades from glycogen index by iodine staining (Mack 1943).

(3) Into one of four grades from glycogen index by carmine staining.

(4) By differential cell-count and calculation of deep index.

(5) By differential cell-count and calculation of the pyknotic index.

(6) By differential cell-count and calculation of the cornified index.

(7) Into one of five grades from the differential count (Kasdon 1953).

Chemical Method

Œstrone, œstradiol-17β, and œstriol were estimated separately in 200-ml. aliquots from the daily specimens of urine by the method of Brown (1955). The amounts of the three œstrogens excreted daily were calculated from the mean of the two estimations and the volume of the 24-hour urine. In outline the method depends on the partial purification and separation of the three œstrogens and their colorimetric measurement, a spectrophotometric correction being applied for non-œstrogenic chromogens.

Usually the smallest amount of each œstrogen calculated to be significantly different from zero is about 1·2 μg. per 24 hours. At this, the lowest level of detection, there is an error of about ±50%—i.e., if a result of 1·2 μg. œstrone per 24 hours is obtained, the true figure may lie between, but not beyond, 0·6 and 1·8 μg. per 24 hours. The percentage error decreases rapidly as increasing amounts of œstrogen are measured, and at 2·5 μg. per 24 hours of each œstrogen the error amounts to about ±20%.

Values for the individual œstrogens in the 75 urine specimens taken were about equally divided between the ranges of 0–1·2 μg., 1·2–4·0 μg., and over 4 μg. daily.

Results

Correlation

Most of the films examined were random samples. The remainder formed groups taken serially from each of three patients. The large majority of the stained films prepared from 75 specimens of vaginal fluid were graded according to each of the seven cytological methods described. For each of the resulting large number of graded films we had the corresponding 24-hour output of œstrogens on the day of collection of the specimen. From these data the correlation coefficient (**r**) was calculated. The number of comparisons made is indicated by **n**, and **p** is the probability.

The results are seen in table I, which shows that:

(1) The urinary output of œstriol correlates with grading by all methods of assessing œstrogenic stimulation of the vagina.

(2) The total urinary output of œstrogen correlates with grading by all cytological methods except the glycogen index

TABLE I—RESULTS

Method of grading	Œstrogen excreted in urine (log μg. in 24 hr.)			
	Œstrone	Œstradiol	Œstriol	Total œstrogen
Simple inspection:				
r	**0·40**	**0·22**	**0·57**	**0·44**
p	< 0·001	> 0·05	< 0·001	< 0·001
n	75	66	75	75
Glycogen index (iodine staining):				
r	Not	Not	**0·42**	**0·37**
p	significant	significant	< 0·001	< 0·01
n			70	66
Glycogen index (carmine staining):				
r	Not	Not	**0·41**	**0·26**
p	significant	significant	< 0·01	> 0·05
n			56	53
Deep index:				
r	**0·21**	Not	**0·31**	Not
p	> 0·05	significant	< 0·01	significant
n	67		67	
Pyknotic index:				
r	**0·22**		**0·53**	**0·38**
p	> 0·05	Not	< 0·001	< 0·01
n	67	significant	67	67
Cornified index:				
r	Not	Not	**0·39**	**0·33**
p	significant	significant	< 0·01	< 0·02
n			66	53
Differential count:				
r	**0·44**	Not	**0·53**	**0·42**
p	< 0·001	significant	< 0·001	< 0·001
n	74		74	74

TABLE II—MEANS OF OUTPUTS OF ŒSTRIOL

Œstrogen grade by simple inspection	Arithmetic means of œstriol values	Standard deviations	Arithmetic means of logarithms of œstriol values	Standard deviation of logarithm of œstriol values	n
0	1·4	2·049	0·757	0·68	19
1	2·8	3·268	0·943	0·793	8
2	4·05	4·468	1·332	0·627	26
3	10·38	9·116	1·784	0·547	21

from carmine-stained preparations and the deep index by differential cell-count.

(3) The output of œstrone correlates with grading by simple inspection and with the assignment of films into one of five grades by a differential cell-count.

(4) The output of œstradiol correlates with none of the seven methods used for the assessment of vaginal stimulation.

(5) The comparison between the output of œstriol and the assignment of films to one of five grades by simple inspection without enumeration of cells gives the best correlation of any in this table.

In calculating r, instead of using the number of μg. of each œstrogen excreted in 24 hours, we used the logarithm of this figure because an almost linear relationship was found to exist when the logarithms of these values were plotted against the degree of œstrogen stimulation determined by cytological grading.

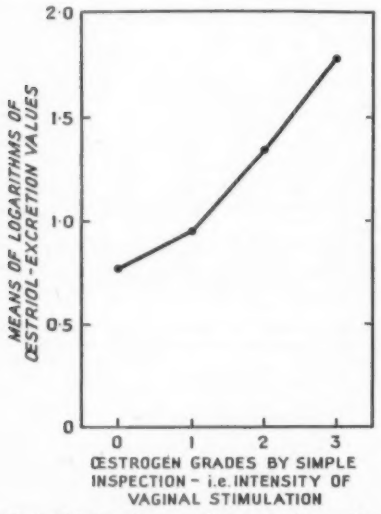


Fig. 1—Relation of means of log œstriol-excretion values to œstrogen grades estimated by simple inspection.

In table II the arithmetic means of the outputs of œstriol and the arithmetic means of the logarithms of the outputs of œstriol are given against each of the œstrogen grades obtained by simple inspection. The respective standard deviations are also given.

The means derived from the log œstriol-excretion figures are plotted against the œstrogen grade in fig. 1. Although the relationship is not exactly linear, the result is highly significant statistically.

Serial Estimations

The results of serial estimations on specimens of urine and serial vaginal films from a menopausal woman aged 56 are shown in fig. 2. The pyknotic index follows the pattern shown by œstriol and the total output of œstrogen. Although not included in the graph, œstrone has a similar correlation. At low œstrogen levels the deep index shows a clear inverse relationship to both œstrogens. Both chemical and cytological methods show an initial rise followed by a gradual fall in both the urinary œstrogen and the intensity of œstrogenic stimulation of the vaginal mucosa. Œstradiol was excreted at a fairly constant rate: 1·5 μg. per 24 hours. A particularly clear relationship is present in this case between the pyknotic index and output of œstriol, and maximum cornification took place two days after the output of œstrogens was greatest.

Two other short series also gave good correlation between vaginal cytology and urinary output of œstrogen.

Accuracy of Œstrogen Estimations

Since the œstriol values show a high degree of correlation with the assessment of the vaginal reaction by all methods of grading, whereas the œstrone values correlate with the grade determined by one method only, the question arises whether this particular lack of correlation is due to inaccurate chemical estimation at very low levels of excretion. Table III shows the percentage of estimations of urinary œstrogens grouped according to whether they fell below our lower limit of sensitivity or below that given by Brown (1955). Over two-thirds of the estimations were below 4·0 μg. per 24 hours.

Nevertheless the œstrone and œstriol values have almost identical distributions. The failure of œstrone to correlate cannot therefore be regarded as due to inaccurate estimations of very low amounts. Œstradiol has a preponderance of low values, and this may explain the absence of any correlation.

TABLE III—DISTRIBUTION OF ESTIMATIONS OF ŒSTROGENS

Percentage estimations	Œstrone	Œstradiol	Œstriol
From 0·0 to lower limit ..	27	48	26
From lower limit to 4 μg. ..	42	42	43
More than 4 μg.	31	10	31

Discussion

Some measure of agreement between the biological and chemical results was to be expected. Brown (1956) has shown a close correspondence between physiological events and the output of œstrogen, while Rubenstein and Duncan (1941) have demonstrated correlation between vaginal cytology and urinary œstrogen measured by bio-assay.

Our work shows that there is a correlation between vaginal cytology and urinary output of œstrogen measured chemically, even when the latter is very low, and such a relationship implies that each method gives a result proportional to the amount of hormone or precursor in the circulation.

The best correlation is that given by œstriol. At first sight this is surprising in view of the alleged biological

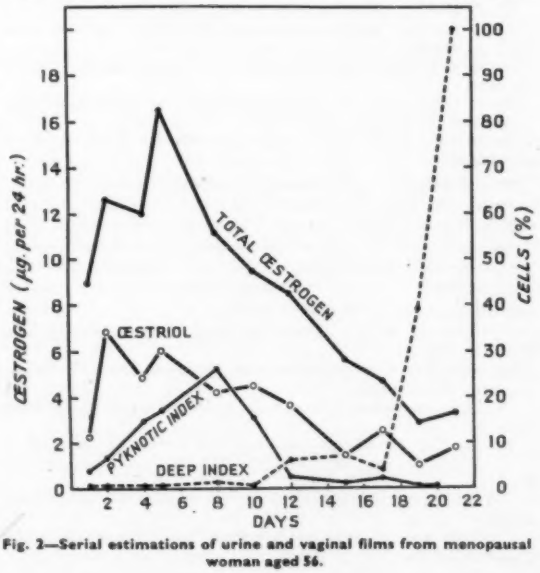


Fig. 2—Serial estimations of urine and vaginal films from menopausal woman aged 56.

inactivity of this steroid. It may be that when œstradiol and œstrone act on their target organs they are metabolised to œstriol. On this supposition the quantity of œstriol excreted would become proportional to the biological effect, and our results support such a thesis.

Close correlation between the cytological and chemical findings is given by the œstrogen grading obtained by simple inspection and by differential counts. At high œstrogen levels the pyknotic index, and at low œstrogen levels the deep index, both give good correlation. The last three methods, however, require the performance of a differential count, which is unnecessary if the same result can be obtained without one.

The value of the correlation appears to be statistical rather than practical. In each œstrogen group the standard deviation is wide and there is considerable overlap in output of œstrogen from one group to another. From the examination of vaginal fluid from different patients taken at random we do not think it possible to predict the urinary level of œstrogens with much accuracy. We believe, however, that in individual cases serial vaginal films can provide a good estimate of urinary œstrogen excretion; or, conversely, that urinary output of œstrogen is an accurate reflection of œstrogen effect on the patient.

Summary

Vaginal cytology and urinary output of œstrogen have been compared on over 70 occasions, and a statistically good correlation has been found between them.

We are indebted to Dr. Clive Spicer for advice on the statistical methods used.

REFERENCES

Brown, J. B. (1955) *Biochem. J.* **60**, 185.
— (1956) *Lancet*, i, 704.
Graham, R. (1950) Cytological Diagnosis of Cancer. London.
Kasdon, S. C. (1953) The Physiopathology of Cancer. New York; p. 942.
Mack, H. C. (1943) *Amer. J. Gynec. Obstet.* **45**, 402.
Rubenstein, B. B., Duncan, D. R. L. (1941) *Endocrinology*, **28**, 911.

PREGNANCY IN THE DIABETIC MOTHER WITH NEPHRITIS

T. E. OPPÉ
M.B. Lond., M.R.C.P., D.C.H.
LECTURER IN CHILD HEALTH IN THE UNIVERSITY OF BRISTOL

DAVID YI-YUNG HSIA
M.D.
ASSOCIATE PROFESSOR OF PÆDIATRICS,
NORTHWESTERN UNIVERSITY MEDICAL SCHOOL, CHICAGO

SYDNEY S. GELLIS
M.D.
PROFESSOR OF PÆDIATRICS,
BOSTON UNIVERSITY SCHOOL OF MEDICINE, MASSACHUSETTS

From the Department of Pœdiatrics, Harvard Medical School, the Boston Lying-in Hospital, and the Joslin Clinic, Boston, Massachusetts, U.S.A.

THE number of juvenile diabetics reaching the child-bearing years with already established renal complications is small, but probably diabetes lasting ten or more years becomes complicated by nephropathy in about 20% of cases (Forsythe and Payne 1956). Many such women wish to bear children, and little is known about the outcome of pregnancy in these conditions. Some clinics either discourage or terminate pregnancy, but no precise information has been published about the risk to the fœtus. We have analysed a series of these cases and report our findings here.

Material

In 1940–56 767 diabetic women attending the Joslin Clinic had pregnancies which attained viability (28 weeks). Of these, 31 (4%) were in White's (1949) class F, and 10 other women in class F became pregnant but had their pregnancies terminated naturally or artificially before 28 weeks. Class-F pregnancies are uncommon, even in a clinic dealing with large numbers of diabetics. A woman was classified as belonging to class F if, when her pregnancy became known, she had chronic renal disease in addition to diabetes. The presence of other complications of diabetes—e.g., calcified vessels and retinitis proliferans—were ignored for classification purposes. All these women had diabetes of long duration, all had retention of nitrogen, and some had hypertension and diminished renal function. Albuminuria was constant, but it is not uncommon in all diabetic pregnancies. Many women had other vascular complications of diabetes. Unfortunately the renal lesions of diabetes are not yet susceptible to precise clinical classification. Moreover, although all these women probably had intercapillary glomerulosclerosis, it is uncertain how many had chronic pyelonephritis also.

Methods

The pregnancies were managed according to the régime of Nelson et al. (1953), which includes close supervision of diet and insulin requirements, together with early antenatal admission to hospital. Some of the women also received large doses of sex hormones. Hydramnios was almost constant, and most mothers had toxæmia in addition to the preceding renal disease. Because of either this or diminished vitality of the fœtus delivery was by cæsarean section in all but 6 cases.

One of the two pædiatricians (S. S. G. and D. Y-Y. H.) was present at each delivery and supervised personally the resuscitation and aftercare of the infant. No matter what their birth-weight was, the infants were managed according to the routine practice for immature infants. All were treated in incubators and given oxygen. Fluids were withheld for the first forty-eight hours, and glucose was not given. Respiratory distress was treated with oxygen and, in some cases, supersaturation of the atmosphere with water vapour. Investigations and treatment were instituted when necessary for specific complications.

Outcome of Pregnancy

Of the 41 class-F mothers 15 were primigravidæ, 19 had had one previous pregnancy, and 7 were undergoing their third or later pregnancy. Altogether the results of 83 pregnancies were known. There were no maternal deaths, but therapeutic abortion was induced in 8 cases because of either increasing renal disease or advancing retinitis proliferans. It was considered justifiable to sum the total pregnancy experience (table I) to give some idea of the over-all hazard to the fœtus, although we realise that, at the time of the previous pregnancies, not all the women had progressed to nephropathy or received the same obstetric care. The 61% survival-rate of the 31 viable fœtuses of the present series of pregnancies may be compared with the experience of 736 viable pregnancies in women with diabetes but without nephro-

TABLE I—OUTCOME OF PREGNANCIES

Outcome	Pregnancies		
	Present (41)	Past (42)	Total (83)
Miscarriage	2	26	28
Therapeutic abortion	8	0	8
Stillbirth	4	2	6 (*8%*)
Neonatal death	8	5	13 (*16%*)
Total loss	22 (*54%*)	33 (*79%*)	55 (*66%*)
Survival of child:			
Actual no.	19	9	28
% of pregnancies	46	21	34
% of viable fœtuses	61	56	60

pathy who attended the same clinic and were managed in the same way (Gellis and Hsia, unpublished data):

Stillbirths	53 (7%)
Neonatal deaths	84 (11%)
Survivors	599 (82%)

The class-F pregnancies were associated with a greater mortality both from stillbirths and neonatal deaths, but there are insufficient data for us to draw conclusions about the abortion-rate. The number of pre-viable fœtal deaths appears large in the class-F pregnancies, but without precise knowledge of the abortion-rate among other diabetic or non-diabetic pregnancies it is impossible to speculate on the cause. Some women appeared to have a tendency to repeated miscarriages, but such a history did not always preclude an eventually successful pregnancy.

Intra-uterine Deaths

The intra-uterine deaths in the present series took place at 29, 31, 32, and 33 weeks, which fact suggests that the combination of diabetes and renal disease may prove lethal to the fœtus at an earlier stage than is usual in uncomplicated diabetes. However, it was the practice of the clinic to forestall intra-uterine death by early admission of the mother to hospital and rapid delivery at the first signs of diminished fœtal vitality. This procedure may well have prevented intra-uterine deaths at later gestational ages.

Of the 27 live-born infants 17 developed, in the neonatal period, respiratory distress characterised by tachypnœa and grunting respirations shortly after birth, followed by obstructive dyspnœa with retraction of the chest wall and attacks of cyanosis. 8 of them died, and in 6 of these necropsy revealed hyaline membrane and resorption atelectasis. These infants had been delivered by cæsarean section and died 1–96 hours after birth. One other baby died 30 minutes after birth, having failed to establish effective pulmonary ventilation; necropsy revealed intra-uterine asphyxia and aspiration of cellular debris into the lungs. The eighth neonatal death was ascribed to bronchopneumonia. No important congenital abnormalities were observed.

Birth-weights

Many of these infants, unlike the characteristic infant of the diabetic mother, were small. A comparison of

TABLE II—BIRTH-WEIGHTS OF INFANTS OF DIABETIC MOTHERS

Birth-weight (lb.)	Gestational age (weeks)					
	< 33		33–35		35–37	
	Class F	Classes A–E	Class F	Classes A–E	Class F	Classes A–E
< 4	2	4	1	1	2	0
4–5	1	3	1	4	2	3
5–6	1	1	6	18	4	19
6–7	—	0	3	10	5	37
7–8	—	0	—	15	0	35
> 8	—	0	—	1	0	6

birth-weights with those of 157 infants of diabetic mothers (classes A–E) by gestational age confirms this impression (table II).

Discussion

The results of this study confirm the high fœtal mortality in pregnancy where maternal diabetes is complicated by nephritis (Pedersen and Brandstrup 1956) but does not indicate any special cause for this other than what might be suspected from the additive effects of the lesions. That the intra-uterine environment is unfavourable is shown by the tendency to early intra-uterine death of the fœtus and by the latter's relatively small size. After delivery the infant shows a tendency to hyaline membrane, which is known to be an almost constant feature of early neonatal death in the infants of diabetic mothers (Winter and Gellis 1954). Whether this susceptibility is a specific result of maternal diabetes or merely underlines the immaturity of these babies cannot be answered yet (Miller 1956).

The outcome of pregnancy reported here, unsatisfactory though it is, probably represents the maximum that can be achieved by the application of existing knowledge. It therefore seems reasonable to offer the diabetic woman with nephritis an approximately 50% chance of bearing a surviving child under conditions of expert diabetic and obstetric management. Such a risk may well be thought unjustifiable when the dangers of such pregnancies to the health of the mother are also considered.

Summary

41 class-F diabetic pregnancies are reviewed. The fœtal wastage was 55%.

The infants were smaller than infants of diabetic mothers usually are, but showed the same tendency to hyaline membrane as a cause of neonatal death.

Our thanks are due to Dr. Priscilla White for making available her records and to Dr. Phillip Le Compte and Dr. Kurt Benirschke for pathological material.

REFERENCES

Forsythe, C. C., Payne, W. W. (1956) *Arch. dis. Childh.* **31**, 246.
Miller, H. C. (1956) Advances in Pediatrics. Chicago; vol. viii, p. 137.
Nelson, H. B., Gillespie, L., White, P. (1953) *Obstet. Gynec.* **1**, 219.
Pedersen, J., Brandstrup, E. (1956) *Lancet*, i, 607.
White, P. (1949) *Amer. J. Med.* **7**, 609.
Winter, W. D. jun., Gellis, S. S. (1954) *Amer. J. Dis. Child.* **87**, 702.

NEPHROTIC SYNDROME

PREDNISONE THERAPY WITH TWO DEATHS FROM CELLULITIS

IAN P. ROSS
M.D. Lond., M.R.C.P.
MEDICAL REGISTRAR

JOHN H. ROSS
M.B. Camb., M.R.C.P.
SENIOR MEDICAL REGISTRAR

THE LONDON HOSPITAL, LONDON

In some cases of the nephrotic syndrome treatment with corticotrophin or cortisone is of value (Roscoe 1956). The special risks entailed in this form of therapy have often been emphasised and are well summarised by Luetscher et al. (1953). We record here two deaths, due to rapidly spreading cellulitis, during a trial of prednisone in the nephrotic syndrome.

Case-reports

Case 1.—A man, aged 66. In February, 1956, an exacerbation of his chronic bronchitis and emphysema resulted in congestive heart-failure, which was successfully treated with rest, digitalis, and mersalyl. His urine was then repeatedly protein-free. The last weekly dose of mersalyl was given in April and acetazolamide ('Diamox') was substituted.

In August his legs swelled. On examination he had moderate œdema, normal blood-pressure, a daily urinary protein loss up to 28·5 g., plasma-proteins 5·2 g. per 100 ml. (albumin 1·5 g., globulin 3·7 g.), and blood-urea 36 mg. per 100 ml. There were no signs of heart-failure. Renal biopsy showed changes compatible with early type-II nephritis. After $2^1/_2$ weeks' rest with high-protein low-salt diet there was no improvement.

Prednisone 20 mg. b.d. for 6 days was then followed by 10 mg. b.d. On the 7th day of this treatment, when there was still moderate œdema of the legs and back, the right lower part of the abdomen became hot, red, tender, and œdematous. This cellulitis rapidly spread over the abdomen, back, thighs, legs, and chest. The rectal temperature reached 101·5°F, and the patient's general condition rapidly deteriorated. In spite of intramuscular penicillin 1 mega unit b.d. he died within 48 hours. Necropsy was not performed.

Case 2.—A man, aged 35, in February, 1956, developed œdema and was found to have heavy proteinuria and a low

plasma-protein level. In June he had slight œdema, blood-pressure 150/100 mm. Hg, a daily urinary protein loss up to 27 g., plasma-proteins 5·9 g. per 100 ml. (albumin 2·9 g., globulin 3·0 g.), and blood-urea 45 mg. per 100 ml. Renal biopsy showed changes compatible with early type-II nephritis. In spite of $3^1/_2$ weeks' rest with a high-protein low-salt diet the plasma-protein had fallen to 4·7 g. per 100 ml.

Treatment with prednisone 20 mg. b.d. was started on July 3. After 3 weeks the patient had a massive diuresis and improved, and the dosage of prednisone was reduced to 10 mg. b.d. In September, on the same dosage, the œdema returned, proteinuria increased, and the plasma-protein level fell to 4·3 g. per 100 ml. On Sept. 8 the dosage of prednisone was reduced to 5 mg. b.d. 2 weeks later, when he still had moderate œdema up to the lower thoracic region, he developed pain in the back and pyrexia to 103°F, his lumbar region being hot, red, tender, and indurated. This cellulitis rapidly spread over his back, abdomen, thighs, legs, chest, and arms. He was given corticotrophin 50 units instead of prednisone, intramuscular penicillin 1 mega unit b.d., and two days later aureomycin 250 mg. q.d.s. 2 days before death his plasma-sodium and plasma-potassium levels were normal and his blood-urea level 45 mg. per 100 ml. He deteriorated and died within 4 days of the onset of the cellulitis. Immediate post-mortem culture of the subcutaneous fluid from the arms and leg grew *Escherichia coli*.

Comments

The incidence and gravity of intercurrent infections in œdematous patients have been reduced by antibiotic therapy. Both these patients were treated with prednisone and during treatment developed a spreading cellulitis which was rapidly fatal; the source of the infection is unknown. Neither patient was grossly œdematous, and cellulitis would not normally have been considered a serious risk. We think the fulminating nature of the infection was related to the use of prednisone, which is known to have an anti-inflammatory effect. These two fatal cases have impressed on us the necessity for early recognition of cellulitis and for its immediate vigorous treatment.

We wish to thank Sir Horace Evans for permission to publish.

REFERENCES

Luetscher, J. A., Deming, Q. B., Johnson, B. B., Piel, C. F. (1953) *J. Amer. med. Ass.* **153**, 1236.
Roscoe, M. H. (1956) *Quart. J. Med.* **25**, 353.

A GIANT DIVERTICULUM OF THE BLADDER

A. GREVILLE YOUNG
F.R.C.S.E., D.T.M.
CONSULTANT SURGEON, LISTER AND NORTH HERTS HOSPITALS, HITCHIN

A MAN, aged 70, referred by Dr. D. Gullick, was admitted to hospital on Aug. 30, 1955, having had severe abdominal colicky pain for five days. He had not vomited but he had lost his appetite and had had no bowel action since the onset of pain: an enema given the previous day had been returned clear. He had had no trouble with passing urine, there had been no increased frequency, and no nocturia. On admission he passed 10 oz. of urine, which, except for a trace of albumin, was normal on routine examination. Apart from attacks of bronchitis and an operation for varicose veins there was no previous history of importance. In fact, he had regarded himself as a fit man for his age.

Examination.—It was obvious that he was ill, for he was pale and sweating and his tongue was furred. His abdomen was distended and tense and somewhat tender, but there was no rebound tenderness. Bowel sounds were scanty. Hæmoglobin was 111%, and the blood-urea level was 122 mg. per 100 ml. Straight radiography of the abdomen showed coils of dilated gut suggesting obstruction. It was difficult to be sure if there was free gas under the diaphragm.

Giant diverticulum of urinary bladder lying posteriorly. The bladder has been opened, showing the enlarged middle lobe of the prostate.

Operation Findings.—At laparotomy three hours after admission, gas escaped when the peritoneal cavity was opened, and a considerable amount of free purulent fluid was found. An enormous cystic mass resembling a huge ovarian cyst was seen rising out of the pelvis. Needle aspiration of this mass produced fluid like urine; and so a catheter was passed per urethram. As urine was evacuated, the mass gradually subsided. When $8^1/_2$ pints of urine had been drawn off, a more or less normal bladder with a huge diverticulum was revealed.

Further exploration showed a perforation of the first part of the duodenum. This was closed by suture over a plug of omentum. Purulent fluid was sucked out of the peritoneal cavity, and the abdomen was closed, a drainage tube being inserted. The bladder was then opened by a separate supra-pubic incision and an enlarged middle lobe of prostate was found acting as a ball-valve obstruction of the internal meatus. A De Pezzer catheter was inserted for drainage.

Postoperative Course.—During the next few days the patient was treated by gastric aspiration and intravenous drip, and his condition remained fairly satisfactory except that his urinary output fell very low (though it later improved). The ominous feature was that the blood-urea (122 mg. per 100 ml. on admission) rose to 240 mg. Ten days after the laparotomy (on Sept. 9, 1955) the patient had a sudden hæmatemesis followed by melæna. Despite blood-transfusion he died next day.

Necropsy Findings.—The heart was a little dilated, and there were some degenerative changes in its muscle wall. The lungs showed some basal congestion, but the remainder of the respiratory tract showed no abnormality. The peritoneal cavity was dry except for a layer of thick pus around the spleen. The stomach and intestines contained a considerable amount of blood and were dilated. The hæmorrhage had come from two acute gastric ulcers. There was a large duodenal ulcer, the perforation of which was noted to be firmly closed by sutures. The liver showed pallor and fatty changes. The spleen was engorged; the gall-bladder and bile-ducts were normal.

The kidneys and ureters were normal, as were the pancreas and adrenal glands. The bladder was hypertrophied (wall 1 cm. thick), and its mucosa was congested, showing patchy hæmorrhages. The diverticulum on the posterior upper wall had an opening 3 cm. in diameter and a capacity of about 3 litres. The prostate showed slight uniform hyperplasia and a pedunculated middle lobe about 3 cm. in diameter.

Dr. K. A. Mische photographed the specimen after stuffing the diverticulum with cotton waste. Unfortunately, as it had been treated with solution of formaldehyde, it had shrunk somewhat, and so the original huge distension seen at operation could not be fully reproduced. Nevertheless the accompanying figure depicts the immense diverticulum along with the obstructing lobe of the prostate.

Comments

The particular points of interest are:

(1) The absence of any previous history of disturbance of micturition (despite further postoperative questioning of the patient) and the fact that he passed urine in a normal quantity after admission to hospital.

(2) The enormous size of the diverticulum. It held nearly 8 pints at operation, and 5 pints post mortem after treatment with solution of formaldehyde. Winsbury-White (1948), Ainsworth-Davis (1950), and Badenoch (1953) say that bladder diverticula may be larger than the bladder but do not suggest that any are nearly so large as the one reported here. A search through the literature has not revealed any comparable case, but Pfau (1952) reported a diverticular calculus which weighed 610 g. It fitted the diverticulum snugly, and radiologically this appeared to be nearly as large as a child's head, and so considerably smaller than the one described above.

(3) Though theoretically it was probably unwise to remove so much urine rapidly, it was necessary to do so in order to gain access to the duodenal perforation.

(4) Death was due to gastric ulceration and hæmorrhage and not, apparently, to uræmia (though this no doubt was a factor), because necropsy revealed normal kidneys.

REFERENCES

Ainsworth-Davis, J. C. (1950) Essentials of Urology. Oxford; p. 392.
Badenoch, A. W. (1953) Manual of Urology. London; p. 394.
Pfau, L. (1952) *Z. Urol.* **45**, 206.
Winsbury-White, H. P. (1948) Textbook of Genito-Urinary Surgery. Edinburgh; p. 299.

Reviews of Books

Pulmonary Emphysema

Editors ALVAN L. BARACH, M.D., clinical professor of medicine, Columbia University College of Physicians and Surgeons, HYLAN A. BICKERMAN, M.D., assistant clinical professor of medicine, Columbia University College of Physicians and Surgeons. Baltimore: Williams & Wilkins. London: Baillière, Tindall, & Cox. 1956. Pp. 545. 80*s*.

THIS book will be welcomed by those who are looking for a comprehensive, authoritative account of pulmonary emphysema.

Different aspects of the subject are discussed by eighteen well-known American experts. In the opening chapters Barach, Bickerman, and G. J. Beck discuss methods of therapy employed at New York Presbyterian Hospital. In later sections there are interesting appraisals of fairly new forms of treatment—continuous and intermittent positive-pressure breathing, bronchial exsufflation, steroid therapy, and graduated exercise in an oxygen-enriched atmosphere—but the most valuable feature of the book is the insistence on examining problems in the light of fundamental work on respiratory physiology. The disturbance of pulmonary function in emphysema, and its effect on blood-gas exchange and on the pulmonary circulation, are analysed in detail, and there is a chapter on lung-function tests of value in clinical practice. It is unfortunate that in so useful a book the writing does not always match the material: some contributions could be described as treatises on the shortwinded by the longwinded.

The Microscopic Diagnosis of Human Malaria

Part II. *A Morphological Study of the Erythrocytic Parasites.* JOHN W. FIELD, C.M.G., M.D., director, Institute for Medical Research, Federation of Malaya; P. G. SHUTE, M.B.E., assistant director, Malaria Reference Laboratory, Medical Research Council. Kuala Lumpur: Government Press. 1956. Pp. 251.

THIS is the sequel to an earlier volume, *A Short Descriptive Atlas of Thick-Film Diagnosis*, published in 1948.

The present volume begins with a short history of the microscopic diagnosis of malaria in man, and goes on to describe the parasites and their relations with the host red cells. The terms applied to the various stages of the parasites are defined, and the changes which take place in the cells are described. The question whether the parasites are in or on the cells is left undecided.

There are separate chapters for *Plasmodium falciparum*, *P. vivax*, *P. malariæ*, and *P. ovale*, and the authors have adopted a uniform scheme (with appropriate variations) for them all, though *P. falciparum* receives most space. These chapters contain much more than observations on microscopic diagnosis, and the book is, in fact, full of valuable information, not always easy to find elsewhere, on a very wide range of subjects connected with the parasites and even the diseases they cause. The pre-erythrocytic and exo-erythrocytic stages are referred to, but are not described at length since they do not come within the scope of the book.

Methods of examination for malaria parasites—during life and after death—are dealt with, and technical details are given in a full chapter; but perhaps the most notable feature of the book is the extensive set of 59 full-page plates, 24 in colour and the rest in monochrome, illustrating parasites at all stages as seen in thin and thick blood-films. The illustrations of the Malayan parasites are all new, being made by Yap Loy Fong at the microscope in the course of day-to-day work. They are beautiful. The hundreds of monochrome drawings depict the parasites in, one would say, all the shapes they could assume. There are also coloured plates of spores, pollen grains, and other cells of vegetable origin, and other objects which might confuse a diagnosis.

This book is a masterpiece which should be available in all laboratories in which the diagnosis of malaria is undertaken, and in all institutions where the subject is taught.

Diagnostic différentiel radiologique des ulcerations gastriques

GEORGES CANDARDJIS. Paris: Masson. 1956. Pp. 188. Fr.1500.

THIS book is based on an analysis of clinical records and radiographic examinations of some 133 patients submitted to gastrectomy between January, 1950, and December, 1954. The radiological signs are described, and the value of each is discussed in detail. It is a comprehensive and good review of a difficult subject.

Progress Report on Birth Control

LELLA SECOR FLORENCE, chairman of the Birmingham Family Planning Association. London: Heinemann Medical Books. 1956. Pp. 260. 21*s*.

THE title of this book might lead readers to expect a complacent account of grateful patients attending at expanding family-planning clinics. Instead it recognises frankly that there is still much progress to be desired.

The book deals mainly with a survey carried out by the Birmingham Family Planning Association on patients attending their clinic during 1948, with a careful follow-up of a large number (about half) who failed to return. This survey disclosed that to many couples methods of contraception advised at clinics are far from fully acceptable or reliable; and the author urges the need for examination, not only of the work of clinics, but of the general approach of the medical profession to this urgent problem. Sterilisation and therapeutic abortion are discussed with forthright courage.

All workers, medical and lay, in family-planning clinics should read this book; but it will also be useful to other doctors, nurses, and social workers.

Sequeira's Diseases of the Skin (6th ed. London: J. & A. Churchill. 1957. Pp. 843. £5 5*s*.).—The new edition of this book, appearing ten years after the last, is most welcome. The editors, Dr. J. T. Ingram and Dr. R. T. Brain, have ensured that it remains well written, balanced, and comprehensive without being tiresomely encyclopædic. Theory and practice are equally well represented, and bibliography is limited to a helpful minimum. Omission of some of the reproductions of drawings might dispel the slight aroma of mothballs that may unreasonably discourage the use of a book which otherwise has an up-to-date freshness.

International Review of Cytology (Vol. v. New York and London: Academic Books. 1956. Pp. 570. 92*s*.).—The latest issue of this well-established annual series, edited by G. H. Bourne and J. F. Danielli, includes a comprehensive and magnificently illustrated survey of the achievements of electron microscopy, written by F. S. Sjöstrand of Stockholm. Other articles cover such subjects as enzymic adaptation, the subcellular organelles of muscle, and the measurement of intracellular pH, while medical readers may be particularly attracted by T. A. J. Prankerd's paper on transport across the erythrocyte membrane and A. H. Coons's review of the histochemical applications of labelled antibodies.

Well in the lead . . .

Penicillin-V Lilly is an effective oral penicillin that is stable in the acid form and is not inactivated by gastric secretions. For the first time in oral penicillin therapy, clinical results produced are consistently comparable with treatment by parenteral penicillin.
When the case calls for penicillin, let Penicillin-V Lilly—the penicillin that "passes the acid test"—be your choice.
The average dose is 0.5 Gm. daily—125 mg. four times in 24 hours, increased in severe infections.

Available as
'Pulvules' 125 mg. (200,000 units), also 250 mg. and 60 mg. (Paediatric)
Suspension 62.5 mg. per 5 cc. For Paediatric use.
and as TABLETS Penicillin-V-Sulpha, Lilly (Penicillin-V with Sulphonamides).

Lilly

PENICILLIN-V LILLY

ELI LILLY AND COMPANY LIMITED, BASINGSTOKE, ENGLAND

For essential weight gain . . .

STENEDIOL*

The most potent non-virilising tissue building Steroid

*Free from the side-effect of virilisation in the recommended dosage, STENEDIOL is indicated particularly in wasting disease or in convalescence from severe illness where gain in weight is essential.

Dose : Adults (both sexes): One 10 mg. tablet thrice daily after meals ; higher doses up to 150 mg. daily may be given.

Children (boys and girls before puberty): One 10 mg. tablet daily, or on alternate days as required, after meals.

Treatment should be withheld on alternate fortnights.

ORGANON LABORATORIES LTD.

BRETTENHAM HOUSE · LANCASTER PLACE · LONDON · W.C.2

Telephone : TEMple Bar 6785/6/7, 0251
Telegrams : Menformon, Rand, London

reaching high levels FAST.....

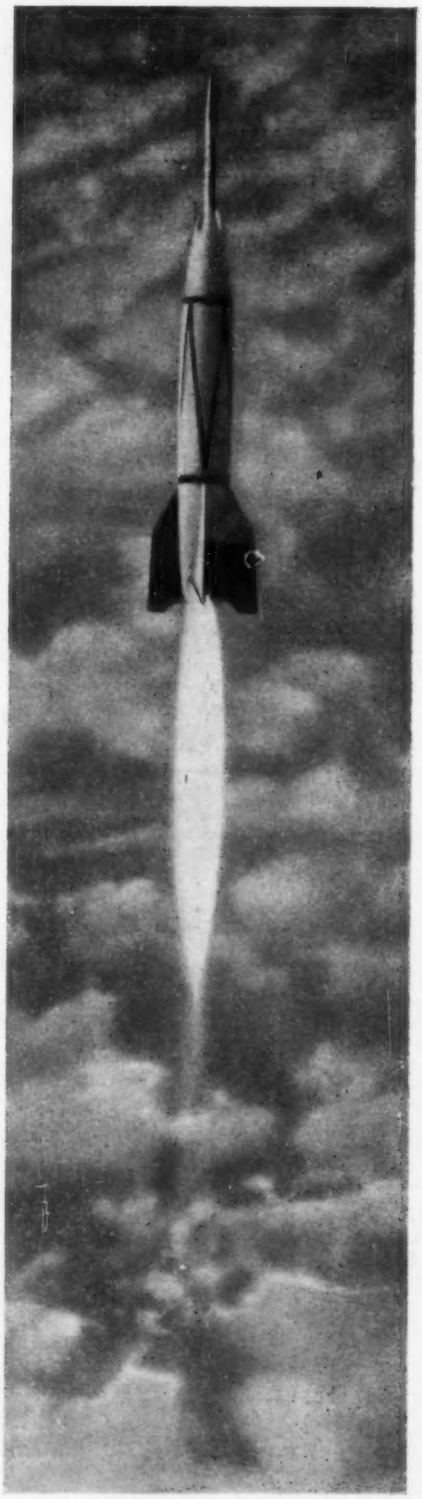
In oral penicillin therapy the most rapid and decisive results by mouth can be achieved if the antibiotic is speedily absorbed, gives a high initial destructive level, and is followed by a sustained inhibitory level at the infected focus. This is accomplished with ***soluble*** potassium pencillin G, the form which is absorbed from the alimentary tract with great efficiency. Such is the type of penicillin presented in Crystapen Tablets and Liquid—preparations that are readily taken and swift to act.

CRYSTAPEN

TRADE MARK

TABLETS (*Sugar-coated or plain*)
Two strengths: 200,000 units (125 mg.)
400,000 units (250 mg.) potassium penicillin G
per tablet in bottles of 12, 100.

LIQUID
200,000 units per fluid drachm. Bottles 2 fl. oz.



GLAXO LABORATORIES LTD. GREENFORD, MIDDX. BYRon 3434

36

THE LANCET

LONDON: SATURDAY, FEB. 16, 1957

Clinical Picture of Sickle-cell Disease

THE sickle-cell diseases have been the subject of intensive research ever since the demonstration by PAULING and by PERUTZ that the extraordinary shapes seen in the red blood-cells were due to the presence of an abnormal type of hæmoglobin which showed curious biophysical changes when exposed to relatively low concentrations of oxygen. HARRIS and his colleagues,[1] in a recent survey, summarise the biophysical change as follows: "in hæmoglobin solutions of concentrations comparable to intracellular conditions, the abnormal hæmoglobin S molecules undergo alignment and parallel aggregation following deoxygenation to form birefringent hæmoglobin tactoids. Consequently, the conclusion was reached that in all probability the birefringent sickled cell is a membrane-covered hæmoglobin tactoid." (A tactoid is a spindle-shaped liquid crystal mass.) We now know that in sickle-cell anæmia the red cells contain 75–100% of this unusual hæmoglobin (hæmoglobin S), with 0–25% of the normal hæmoglobin A. In the sickle-cell trait the red-cell hæmoglobin is a mixture of 25–45% hæmoglobin S with 55–75% hæmoglobin A. Three other sickle-cell diseases have been identified: in sickle-cell/hæmoglobin-C disease the proportions are about 50% hæmoglobin S and 50% hæmoglobin C; in sickle-cell/thalassæmia disease, 67–82% of the hæmoglobin is the sickle-cell form and up to 20% is fœtal hæmoglobin, the small remainder being hæmoglobin A; the third form (sickle-cell/hæmoglobin-D disease) is so far less well-known (a case was described in our columns by STEWART and MACIVER [2]). In all these varieties the oxygen tension at which tactoid formation and sickling can be induced is roughly correlated with the proportion of hæmoglobin S in the red cells of a particular patient.

But patients with sickle-cell anæmia vary considerably in the clinical severity of their disease. They can carry on for long periods in a precarious state of equilibrium between mild hæmolysis and red-cell regeneration, and then suddenly a hæmolytic crisis causes severe anæmia and grave illness. People with sickle-cell trait or with the other varieties of sickle-cell disease rarely suffer any disability and their abnormality is discovered only if their blood is examined because they have some illness, or because a relative has sickle-cell anæmia. But instances have lately been recorded of people who suffered a splenic infarction during an aeroplane flight, and who were found to have sickle-cell trait or one of the other related conditions. ROTTER and his colleagues [3] described 6 such incidents: in 3 the patients had sickle-cell trait, in 2 they had sickle-cell/hæmoglobin-C disease, and the sixth had sickle-cell/thalassæmia; 5 were American Negroes and 1 was a Puerto Rican. GRIGGS and HARRIS [4] studied the levels of oxygen tension at which the biophysical changes of sickling appeared in the various syndromes: in sickle-cell disease, sickling will occur at an oxygen partial pressure of 60 mm. Hg, a tension corresponding to that of mixed venous blood; the patients with 50–80% of hæmoglobin S, such as is found in sickle-cell/hæmoglobin-C and sickle-cell/thalassæmia diseases, must have a lower oxygen tension of about 40 mm. before sickling appears; and in sickle-cell trait the oxygen partial pressure must be reduced below physiological levels (to 10 mm.) before the cells will sickle. Even though the patients who had splenic infarction were travelling in unpressurised planes, it is not certain that the oxygen partial pressure in their mixed venous blood fell as low as 10 mm., and it is noteworthy that symptoms did not come on until the patient had been some time in the air. All this suggests that some factor in addition to low oxygen tension is concerned in the production of the *clinical* manifestations of the sickle-cell diseases. ALLISON [5] suggests that this additional factor is time—the time of exposure of abnormal red cells to low oxygen tension.

What ALLISON has done is to repeat some older experiments in which blood from patients with sickle-cell disease is equilibrated with gas mixtures under conditions corresponding to mixed venous blood; such a gas mixture has an oxygen partial pressure of 40–45 mm., and when blood from a patient with sickle-cell disease is equilibrated at 37°C for four hours, 10–20% of the red cells become sickled. But if venous blood from an antecubital vein of such a patient is fixed by formalin immediately after withdrawal, sickle cells number less than 2%. The reason for this is that a period of some *minutes'* exposure to low oxygen tension must elapse before the maximum sickling develops; thus, ALLISON shows that after two minutes' partial deoxygenation the proportion of sickled red cells is about 5% but after six minutes it has risen, in various samples, to between 12% and 18%, most of the increase taking place between two and four minutes. From estimations of circulation-time, it seems likely that under physiological conditions most red cells are deoxygenated for ten to twelve seconds, and only a few for longer than fifteen seconds. Thus, though most tissues are sufficiently low in oxygen to induce some sickling of red cells in persons with sickle-cell disease, the fact that the red cells are exposed for only fifteen seconds or so means that most cells will be re-oxygenated before they can become sickled. But if anything holds up the flow of cells through the tissues, the proportion of sickled cells will rise rapidly; any form of vasoconstriction or inflammation, for example, could in that way increase sickling, and since the sickled cells themselves are likely to intensify the hold-up by blocking blood-vessels, it is easy to see how a "crisis" can be built up. ALLISON observes that restoration of sickled cells by re-oxygenation takes just as long as the process of sickling, so that when sickled cells escape into the general circulation they will not stay long enough in well-oxygenated parts to allow them to revert to a discoid shape. As HARRIS et al.[1] point out, sickled cells are mechanically fragile and rapidly destroyed, so that once sickling begins on any sizeable scale, a hæmolytic phase soon appears. ALLISON also notes

1. Harris, J. W., Brewster, H. H., Ham, T. H., Castle, W. B. *Arch. intern. Med.* 1956, **97**, 145.
2. Stewart, J. W., MacIver, J. E. *Lancet*, 1956, **i**, 23.
3. Rotter, R., Luttgens, W. F., Peterson, W. L., Stock, A. E., Motulsky, A. G. *Ann. intern. Med.* 1956, **44**, 257.
4. Griggs, R. C., Harris, J. W. *Arch. intern. Med.* 1956, **97**, 315.
5. Allison, A. C. *Clin. Sci.* 1956, **15**, 497.

that sickling takes place more readily in the spleen than in other organs, and in the spleen stasis of blood is physiological.

As we have already seen, in patients with sickle-cell variants, sickling occurs only when the oxygen tension is reduced to between 15 and 40 mm., and in people with sickle-cell trait, oxygen pressure must be even lower. The only conditions in which such low pressures are commonly found are in aeroplanes. ROTTER et al.[3] think that persons with sickle-cell trait may be in danger of sickling and splenic infarction only when flying at 10,000–15,000 feet in unpressurised aircraft; but persons with sickle-cell/hæmoglobin-C or sickle-cell/thalassæmia disease may have sufficient abnormal hæmoglobin for sickling to develop at 4000–6000 feet, and many commercial airlines operate at such heights. They think the problem sufficiently important to warrant the screening, by paper electrophoresis, of Negro and Puerto Rican military personnel to detect those who have any abnormal hæmoglobin. Sickle-cell diseases are also common in the West Indies (HERRICK's original case, described in 1910, was a West Indian from Grenada), so the same problem may arise there. In fact, the diseases produced by abnormal hæmoglobins may become of increasing significance in many ways because they are common in countries where much has lately been done to check malnutrition and the infectious diseases, which were prolific causes of death and which made the hæmoglobin disorders seem relatively trivial. LEHMANN [6] remarks how the hæmoglobin abnormalities may thus assume increasing importance in many parts of the world; the change is already apparent, he points out, in the Lake Kopias area of Greece, where sickling and thalassæmia are common but where the once formidable malaria has been eradicated, and where the hæmoglobinopathies are now the most pressing medical problem.

Keratinous Cysts in the C.N.S.

KERATINISING squamous epithelium in the wrong place behaves with great uniformity, wherever that place may be (and most parts of the body may be involved) and by whatever mechanism of displacement, maldevelopment, metaplasia, or even benign neoplasia it may get there. It rounds off into a cyst, and the gradual accumulation of keratin leads to the growth of the cyst, a growth measured often in decades rather than years. Breakdown of the keratin results in the accumulation of that ultimate indigestible fragment of most protein complexes, cholesterol. The cyst contents are in fact highly irritating and excite a violent granulomatous reaction if the protecting layer of squamous epithelium breaks down. In the body generally it is easy to recognise this constant pattern in "sebaceous" cysts, in implantation dermoids, in the cysts which complicate buried whole-skin grafts and the healing of epithelialised sinuses, in ureteric stumps, in line-of-closure dermoids (of which branchial cyst is the type), and in benign teratomatous cysts like the ovarian dermoid. The presence of sebaceous glands and hair follicles in the lining of the teratomatous cysts (and sometimes in the line-of-closure dermoids, and rarely in the other types) makes remarkably little difference to the behaviour of these cysts, though it alters the appearance of the contents. For this reason, little care has been taken to distinguish in ordinary speech between the terms "dermoid" and "epidermoid" cysts.

Keratinous cysts in and about the central nervous system are usually described (often under the name of "pearly tumours") as though they were a separate entity, and had an element of unexpectedness denied to similar cysts elsewhere. In fact they differ little in diversity of origin and uniformity of behaviour from those found elsewhere in the body. They are not very rare, forming as much as 1% of reported series of cerebral "tumours." Series as large as 23 cases [1] have been described in the past, and TYTUS and PENNYBACKER,[2] in Oxford, have lately recorded 43 cases. Their work illustrates the many different sites in which these lesions may arise: 2 were pericranial, 6 orbital, 6 petrous, 2 diploic, 2 suprasellar, 7 intracerebral, 3 cerebello-pontine, 8 midline subtentorial, and 7 spinal. A few of these can be extracted as special groups: 3 of the midline subtentorial and 2 of the spinal cysts had associated dermal sinuses, which could clearly be responsible for the complication of septic meningitis; and, perhaps for that reason, this variety often causes symptoms early in life. These midline cysts are obviously due to imperfect closure of the neural canal, a simple and obvious type of congenital lesion. The suprasellar ones are perhaps related to Rathke cysts. The petrous lesions include some at least of the "cholesteatomas" of the otologists: it is interesting to find that it is by no means certain that these are the chronic infective granulomas that they are generally assumed to be, but may be primary keratinous cysts of the petrous bone infected secondarily from the middle ear. Teratomatous cysts of the pineal body or elsewhere in the median plane must also be included, though they are rare and usually malignant.[3] Benign forms do occur, however, and it is not clear whether TYTUS and PENNYBACKER saw no such lesions or have deliberately excluded them. The remaining cysts seem to be scattered almost at random through the brain, the meninges, and the adjoining bone. They are not confined to the midline, and malocclusions of the neural canal will not account for them. It can only be supposed that, since the brain is ectodermal in origin, and the meninges and a surprisingly large part of the cranium arise from the neural crest [4] which is also ectodermal, we are witnessing the occasional anomalous appearance (presumably congenital) of the most characteristic end-product of the ectoderm, squamous epithelium, at these unlikely sites.

The symptoms to which these cysts give rise are those of any benign space-occupying lesion of very slow growth. The absence of protein changes in the cerebrospinal fluid may be of help in diagnosis. Treatment should clearly be excision as early as possible. Even when involvement of vital structures makes complete excision of the lining epithelium impossible, the slow rate of growth fully justifies partial removal; but escape of the irritant contents into the C.S.F. is a complication to be avoided if possible.

6. Lehmann, H. *Practitioner*, 1957, **178**, 198.

1. Rand, C. W., Reeves, D. L. *Arch. Surg.* 1943, **46**, 350.
2. Tytus, J. S., Pennybacker, J. *J. Neurol. Psychiat.* 1956, **19**, 241.
3. Russell, D. S. *J. Path. Bact.* 1944, **56**, 145.
4. Hörstadius, S. The Neural Crest. Oxford, 1950; chapter 3.

The analogy between these cysts and those appearing elsewhere in the body has recently been completed by CHOREMIS et al.,[5] who demonstrated that implantation dermoids can arise in the spinal canal, and described 6 examples after recovery from tuberculous meningitis. CHOREMIS et al. justifiably assumed that these cysts arose from squamous epithelium carried into the canal during one of the many spinal punctures involved in the treatment of tuberculous meningitis. It is curious that this sequel has not been observed before; for examination of drill biopsies shows how often an ordinary needle carries a little disc of skin in with it. CHOREMIS et al. used a spinal needle without a stilette, and it may well be that the general use of a stiletted needle for spinal puncture has had the unforeseen but fortunate result of preventing this unpleasant complication.

"Doctor"

IF names are important—and they are—the descriptions and titles given to different kinds of doctor in this country should be reconsidered before they become any more chaotic. In the first place, is it allowable to use the word "doctor," in this way, to denote members of our own profession, implicitly excluding anyone without a medical qualification? In his article a fortnight ago Dr. GEORGE GRAHAM explained how last century the holders of medical licences managed to capture for themselves a title which, in its primary meaning, belonged only to holders of university doctorates. Whether or not this act of aggression was justifiable, it has certainly been successful—so successful that the secondary meaning of the word is now dominant, and when people say "He's a doctor" or "Is there a doctor in the house?" there is no thought in their minds of higher degrees or of any faculty but medicine. Of course everybody knows that there are other kinds of doctor—in law, divinity, science, music, philosophy, and so on—but the assumption is that anyone called Doctor is medical unless stated to be otherwise. In any medical context or environment there is particular reason to suppose that the title has a medical connotation, and this week we publish a letter showing how much difficulty and annoyance can arise, in consequence, where doctors whose degrees are not medical are associated with our profession in their work. In this journal, to prevent any misunderstanding, we have long made a practice of referring to non-medical doctors on their first mention as "Miss A. B. Dash, PH.D.," or "Mr. A. B. Blank, D.SC."—after which explanation we naturally accord them their proper title. To many this has seemed tiresome and invidious; but it is at least better than the custom by which some hospital nurses and others refuse to call anyone Doctor unless he is on the Medical Register. No doubt, as the Medical Act of 1858 says, "it is expedient that persons requiring medical aid should be enabled to distinguish qualified from unqualified practitioners"; but it is paradoxical, to say the least, that titles which are incontestable, because conferred by a university, should thus be set aside in favour of one which is conferred only by courtesy and custom. Now that some of the best work in medicine is done by science graduates who do not happen to have a medical qualification, most hospital workers should surely have become accustomed to the presence of more than one kind of doctor in the Greater Medical Profession[1]; and politeness if nothing more suggests that doctors of science or philosophy should be addressed in hospital as they would be outside. Has not the time come, indeed, when our emphasis could be less on distinctions and more on the common effort?

The next anomaly is that, though our entire profession have acquired a *de facto* right to call themselves Doctor, this title is spurned by many of those who hold it *de jure* as university doctors of medicine. If we ask why surgeons should have cherished their lesser title of Mister, and why obstetricians and gynæcologists adopted it, the answer may be that they liked the prestige of difference, or that they loved tradition, or merely that the public were known to associate Misters with rather higher fees. These reasons may be respected, or at any rate understood: but is it really still necessary or desirable to lay so much stress on the unlikeness of the surgeon to other doctors? Times have changed since WOODALL in 1639 could epitomise the characteristics of the two branches of the profession by saying that "the more learned sort are justly stiled by the title of Physicians, and the more experienced sort are called Chirurgions or Surgeons."[2] Today not only are surgeons learned and physicians experienced, but the former sharp division between their functions is breaking down. With physicians using operative techniques, and surgeons practising electrolytic augury, the everyday work of many specialties shows an increasing reintegration of medicine and surgery; and we are already seeing the emergence of neurologists and thoracologists who are professionally ambidextrous—limited, perhaps, by the region or system with which they are concerned, but paying no attention to the limits formerly denoted by "surgical" and "medical." For our part we deplore the persisting separation of surgeons, not only because it discourages a natural evolution in the specialties but also because it is bad for the profession. The functional union which was officially achieved in 1858 with the creation of a Medical Register has never been completed except on paper; but it would be brought a stage nearer reality if surgeons and gynæcologists would hearken to the words of Dr. GRAHAM, and of Dr. LAMBERT ROGERS last week—if they would curb their separatist tendencies, and accept the same honourable title as all the other exponents of our science and art.

If specialists in surgery are to be asked to sacrifice, for the general good, their title of Mister, specialists in medicine may equally be asked to abandon their lien on the designation of physician, which ought to be once more at the disposal of any member of the profession. In the old days the family doctor put on his plate Physician and Surgeon, and only comparatively recently has the idea arisen that these names are the exclusive property of consultants who confine themselves to one or other of the branches. If the fellows or members of the Royal Colleges of Physicians react to our suggestion by claiming a monopoly, we shall remind them of Henry VIII's remarks:

5. Choremis, C., Economos, D., Papadatos, C., Gargoulas, A. *Lancet*, 1956, ii, 437.

1. See *Lancet*, 1956, ii, 779.
2. *See* New English Dictionary, vol. vii, p. 807.

" Forasmuche as the science of phisicke dothe comprehend . . . the knowledge of surgery as a speciall membre and parte of the same, therefore be it enacted that anny of the said company or felawiship of Phisitions . . . may exercise the said science of Phisick in all and every his membres and partes." [2]

The practice of surgery, then, does not prevent a person being a physician—a principle indeed inherent in the present constitution of the London college, which since Lord DAWSON's time has conferred its fellowship on people in almost every department of medicine, including a number who are known elsewhere as surgeons. If " physician " could be restored as applicable to anyone with a medical qualification, " family physician," or even " general physician," could take the place of " general practitioner "—a term without ancestry or international currency, conceived (we believe) in desperation and a Government office. It could be used, too, in describing any post held by a doctor as such—e.g., physician biochemist to St. A's Hospital, or physician administrator to St. B's.

Which brings us to a neologism that really does matter—" medical officer." To many people, of course, this seems no more than a harmless synonym for doctor; but that is either because they are insensitive to its implications or because they are no longer interested in professional freedom. In its military sense, " officer " implies a person occupying some position in a chain of command; and in clinical medicine there should be no chain of command. In administration, " officer " means a person holding office under government; and in this sense it is wholly inapplicable to hospital doctors or general practitioners in the National Health Service, who work under contract with a non-governmental board or committee and are definitely not Civil Servants. As everybody well knows, patients attending a hospital or surgery want the help of a doctor, not of an official; and it would be salutary to emphasise the correct personal relationship of doctors with their patients by eradicating from medicine all use of the bureaucratic term " officer." The professional equivalent is " physician " or " surgeon "; and in hospital the present casualty officers and resident medical officers could properly be called casualty house-surgeons (or assistant casualty surgeons) and resident assistant physicians. In industry there is the same need for the doctor not to let himself be represented as an official; and, instead of industrial medical officer, he should be called industrial physician. For the M.O.H. and his staff " medical officer " is partly accurate; for, besides advising his authority, the M.O.H. is an executive officer, charged with enforcing the law; but, even so, it is preferable to think of him primarily as physician (or health physician) to his borough or county. Again, in the Civil Service, though technically doctors are officers of the Crown, they exert their influence almost entirely as advisers, and it would be better if Sir JOHN CHARLES were called chief physician to his Ministries. Our terminology should be such as to show that, wherever a doctor is working, he is there as a member of his profession; and, in small things as in great, we should use the names and words that belong to our profession rather than those that belong to government. Thus for doctors to say (as so many now do) that they are going " on leave " is in 1957 no longer excusable as a nostalgic echo of the war. In the N.H.S. at any rate, the doctor is not a subordinate who applies for leave but a physician who takes a holiday or vacation when he is satisfied that his patients' needs can be temporarily met by someone else. Too many members of our profession have shown themselves readily addictable to bureaucratic language, and this addiction is more perilous than anything that administrators could do to the profession from outside. If doctors continue long enough to think of themselves as no more than medical officers in what so many of them persistently miscall a State service, that is what they will infallibly become. For as a man " thinketh in his heart, so is he."

Annotations

TRAINING THE ASSISTANT

IN 1954 the General Medical Services Committee of the British Medical Association appointed a subcommittee to examine the scheme for training assistants in general practice. Their report [1] is a clear endorsement of the scheme, which has fully justified itself and should remain a permanent feature of the National Health Service. The report makes constructive suggestions which would increase the value of the scheme still further, and it proposes that an advisory body be set up. This body would keep the future evolution of the scheme under review, and it would include two members of the council of the College of General Practitioners. This collaboration with the college at the centre might be extended to the periphery, and the selection boards of local medical committees, who interview applicants for appointment as teachers, might well seek the help of the postgraduate education committee of the college faculty.

The trainee-assistants scheme could usefully be expanded as more family doctors prove that they can teach others to attain the high standards of work they have themselves achieved. The selection of teachers must be strict, but the proposed advisory body would have promising material to develop; and teachers, potential and actual, would be encouraged to attend courses, such as those offered by the British Postgraduate Medical Federation.

Perhaps the most important line of future development is indicated by the report's remark that the advantages of the scheme should not necessarily be restricted to those intending to make a permanent career in general practice. Although the present arrangements were devised for general practitioners, a number of registrars take advantage of a year's training in general practice. A full year's work with a general practitioner might restore to the future consultant something which he is in danger of losing—the ability to see beyond the limits of an ever-narrowing specialty. Some senior hospital appointments are now being filled by doctors whose outlook is entirely confined to hospital medicine, and the help they can give to the family doctor must be restricted because their advice can be framed only in terms of experience gained in institutions. With the help of the Postgraduate Federation, the universities, and the College of General Practitioners, general-practitioner teachers may, within the next few years, be able to offer a year's training in breadth to all those on their way up the rungs of the hospital ladder. And it may even be that a trainee assistantship in general practice may become an essential for the higher university and hospital clinical appointments.

1. Report of Trainee General Practitioners Subcommittee. British Medical Association. Circulated to Executive Councils by the Ministry of Health (E.C.L. 5/57).

CANCER AND ATHEROSCLEROSIS

FROM time to time pathologists have pointed out that patients dying of malignant disease have less atherosclerosis than those who die of other causes. The most obvious superficial explanation of this difference is that those with malignant disease may have lost more weight than the others; and Wilens [1] showed that at necropsy coronary atheroma was less severe in patients who had lost weight than in those who had not. The most evident difference between the two groups lay in the amount of lipoid infiltration, though there was also some difference in the amount of hyaline change and calcification.

Recent work has suggested that the obvious answer may not be the correct one. Elkeles [2] has approached the problem radiologically. Having previously found that patients with cancer of the stomach had much less calcification in their abdominal aortas than patients with gastric ulcer, he has gone on to consider the frequency of aortic calcification in patients with cancer elsewhere. 700 control cases were compared with 416 patients in the same age-groups with proven malignant disease, and the amount of calcification was roughly graded by eye. In view of the possible dangers of observer error in such a subjective assessment, it might have been better to use a "blind" method of scrutiny. Nevertheless, the results seem quite clear. Calcification of the aorta was seen in just under 19% of the cancer group and in rather more than 35% of the control group. The difference was greatest in the patients aged 71–80, where 28% of the cancer group showed calcification, compared with 72% in the control group. Elkeles remarks that his results do not support the view that wasting is responsible for the reduced frequency of calcification in patients with cancer, but he gives no direct evidence to support this statement. The most interesting indication that wasting is not the true explanation comes from a comparison of the frequency of calcification in patients whose cancers arose from different primary sites. Calcification was seldom seen when the primary tumour was in the stomach, breast, or prostate; but when the primary site was in the respiratory tract, calcification was as common as it was in the control population. In general, this finding agrees with the results of Creed et al.,[3] who investigated the incidence and severity of aortic atheroma in a series of 1223 necropsies. They themselves examined only 167 of these specimens; the rest were evaluated from post-mortem records. Nevertheless, they felt confident enough to undertake a statistical assessment of the results. They found that patients who had died of bronchial carcinoma had the same degree of atherosclerosis as patients with hypertension, and significantly more than the control population. The severity of atherosclerosis was significantly less in patients who had died of leukæmia or malignant lymphoma. Surprisingly, patients who had lost weight rapidly before death showed more atherosclerosis than patients who had not lost weight, or who had lost weight slowly.

It is hard to draw any definite conclusions from these studies. Though some of the evidence is conflicting and insecure, it is clear that atherosclerosis and malignant disease are related in some peculiar way. It may well be that a better understanding of this relationship will lead to big advances in our knowledge of both types of disease, so that inquiries of this kind are of great importance. Because of the distribution of carcinoma of the stomach between the different blood-groups [4] and the familial distribution of hypertension,[5] it is tempting to consider a genetic basis for the relationship; but a great deal of careful work is required before this idea can be seriously entertained. In the circumstances the anomalous position of bronchial carcinoma in relation to atherosclerosis might be attributed to extraneous carcinogens.

1. Wilens, S. L. *Amer. J. Path.* 1947, **23**, 793.
2. Elkeles, A. *Brit. J. Cancer*, 1956, **10**, 247.
3. Creed, D. L., Baird, W. F., Fisher, E. R. *Amer. J. med. Sci.* 1955, **230**, 385.
4. Aird, I., Bentall, H. H., Fraser Roberts, J. A. *Brit. med. J.* 1953, i, 799.
5. Hamilton, M., Pickering, G. W., Fraser Roberts, J. A., Sowry, G. S. C. *Clin. Sci.* 1954, **13**, 273.

PROGRESS IN MICROSCOPY

POSSIBLY no single instrument has done more for medical and biological research than the microscope. After Zernike's development of the phase-contrast microscope (a contribution recognised by the award of a Nobel prize in 1953) microscopy went through a stage of remarkable progress. The pace of discovery now seems to be slackening and it is possible to take stock. One way of doing so is to consult a useful series of thirteen articles, originally published in *Research*, which have now been reprinted as a small book.[1]

Electron microscopy, discussed by V. E. Cosslett, has been transformed by the development of methods for cutting sections of the order of one-fiftieth of a micron in thickness. This has led to such important advances in cell micromorphology that the electron microscope should become part of the routine equipment of every medical school. The chief use of reflecting microscopes, the subject of two contributions by K. P. Norris and E. M. F. Roe, is in ultraviolet and infra-red microspectroscopy, from which valuable chemical information can often be derived about microscopic objects. Unfortunately the main sources of error in this technique as applied to cytology seem to lie in the nature of the specimen itself rather than in the optical system; and the results are not as accurate quantitatively as was once hoped. Of the many medical applications of fluorescence microscopy, reviewed by J. King, the detection of tubercle bacilli is one of the most familiar. A promising technique is that in which proteins conjugated with fluorescent dyes are used to study antigen-antibody reactions.[2]

The value of phase-contrast microscopy in elucidating the structure of living cells is well known, but R. Barer illustrates a less familiar use: it can give a quantitative measure of the refractive index of parts of living cells, and in this way the concentration of solids can be deduced. An application of special interest to pathologists is the measurement of hæmoglobin concentration in single red cells and the study of its distribution among different members of a red-cell population. F. H. Smith describes several types of interference microscope, which give results broadly similar to phase-contrast, but they can sometimes be used to measure optical path (i.e., the product of refractive index and thickness)—a quantity which can be related to the dry mass per unit area, so that cells can now be "weighed" under the microscope. Refractometry and interferometry are closely related methods which may be expected to yield much useful quantitative cytological information. D. Causeley and J. Z. Young describe the flying-spot microscope, and they refer particularly to the counting of cells and particles. A red-cell count can be done in only four seconds, but the degree of consistency is perhaps a little disappointing. X-ray microradiography, discussed in this book by W. C. Nixon, may prove useful in biology, not so much because of its resolving power (which is as yet only comparable to that of an optical microscope), as because it may reveal new types of contrast by displaying the relative opacity of some tissue constituents to X rays, though not necessarily to light. It is also particularly useful for three-dimensional stereoscopic views of quite thick specimens. There are still many physical difficulties to be overcome, and long exposures of the order of several minutes are usually needed.

1. Modern Methods of Microscopy. Edited by A. E. J. VICKERS. London: Butterworths Scientific Publications. 1956. Pp. 114. 15*s*.
2. Coons, A. H., Kaplan, M. H. *J. exp. Med.* 1950, **91**, 1.

Microscopy is clearly very much alive and there are many new techniques waiting to be applied more widely in medicine.

AUTO-ANTIBODIES IN RHEUMATISM

THE hypothesis that rheumatic fever (and possibly other rheumatic diseases) are due to the presence of irregular antibodies to the patient's own tissues has always seemed attractive. Cavelti [1] was among the first to claim the discovery of such "auto-antibodies" in the sera of patients with active rheumatic fever: he used patients' serum and collodion particles sensitised with human heart antigen to demonstrate positive agglutination tests between the two; but Fischel and Pauli [2] were unable to confirm this work. More recently, in Vienna, Steffan and his colleagues [3] have used a "Coombs reagent deviation test" to show that when a suspension of human heart tissue is incubated with serum from patients with active rheumatic endocarditis it absorbs a specific factor (presumably gamma-globulin) from the serum. A heart-tissue suspension treated in this way can significantly reduce the titre of a Coombs anti-human-globulin serum by absorption. Similar "antibodies" reacting with mixed tissue suspensions of muscle, joint capsule, and heart were found in rheumatoid-arthritis sera by the same very indirect methods.

Rejholec and Wagner,[4] in Prague, have now returned to the collodion-particle technique in attempts to demonstrate auto-antibodies in rheumatic-fever sera. They sensitised collodion particles with saline extracts of mixed tissue from the organs of a cadaver—myocardium, heart valves, subcutaneous tissue, and joint capsules; and they noted that such "antigens" were very unstable and that preparations from many cadavers were unsatisfactory. The sera of 38 patients with rheumatic fever were tested at various stages in the progress and treatment of the disease, and in each case the collodion-particle agglutination test was positive with at least one (and usually with all) of the "antigens" described; patients with clinical active myocarditis gave the highest titres. The serum factor responsible for these reactions (whose specificity was controlled) was extremely unstable in vitro, disappearing within a week unless the sera were kept at −20°C. This difficulty, and those inherent in the collodion-particle agglutination method, make it unlikely that experiments will be attempted to correlate results obtained by this method and by that of Steffan.

How far do such experiments substantiate an auto-antibody hypothesis in rheumatic disease? It is doubtful whether the reactions attributed to rheumatic sera in experiments of this kind are really due to specific immunological phenomena. The antigens presumed to take part in the reaction are completely uncharacterised, even in the broadest sense; muscle, heart valve, and joint capsule must share most of the body antigens between them. It is perhaps useful to compare the present approach to the investigation of auto-antibody formation as a cause of disease with that adopted in the probably related field of hypersensitivity. The unravelling of the immunological fabric of allergy, while far from complete, owes much to the physical and biochemical characterisation of relevant antigens, which in turn has permitted quantitative and analytical study of serological activity in vivo and in vitro. In the study of rheumatism, immunological research sadly lacks a defined antigen or group of antigens. If, in fact, antigens do act as immunological determinants of rheumatism, real progress towards understanding its cause must await their identification.

1. Cavelti, P. A. *Proc. Soc. exp. Biol., N.Y.* 1945, **60**, 379.
2. Fischel, E. E., Pauli, R. H. *J. exp. Med.* 1949, **69**, 143.
3. Steffan, C., Schindler, H. *Schweiz. Z. Path.* 1955, **18**, 287. Polzer, K., Steffan, C. *Cardiologia*, 1956, **28**, 380.
4. Rejholec, V., Wagner, V. *Experientia*, 1955, **11**, 278. Wagner, V., Rejholec, V. *Ann. rheum. Dis.* 1956, **15**, 364.

ANÆSTHESIA FOR BURNED CHILDREN

BECAUSE of the need for long and specialised treatment, children with severe burns are usually admitted to special units as soon as possible after the accident, and such units have their own anæsthetists. But every anæsthetist should know how great the difficulties of anæsthetising a burned child can be, because the occasional case may reach any hospital.

At the section of anæsthetics of the Royal Society of Medicine on Feb. 1, Dr. D. W. Shannon drew attention to the importance of resuscitation during the first forty-eight hours after the child has been injured, when the difficulties to be met were those peculiar to resuscitation in children as well as those of the burns themselves. When more than 10% of the skin area was damaged, the child's body could not adjust itself to the train of events set in motion, and unless treatment was begun rapidly and then sustained, deterioration would quickly set in. Replacement of fluids and adequate oxygenation of the tissues were the twin essentials of therapy. Burned children, Dr. Shannon remarked, had a remarkable thirst for oxygen, arising not only from their normal physiological requirements (which were much greater than those of adults) but from several factors, connected with burns, which were likely to affect respiration. The respiratory muscles might be harmed; the air passages were often made œdematous by noxious fumes; spreading inflammatory œdema might press on the trachea; crusted sores in the neighbourhood of the nares often caused obstruction; and unwise dosage of drugs might induce a general depression. Moreover, the whole picture was accentuated by oligæmic shock. Effective resuscitation, with intravenous fluids and with oxygen, must therefore be supplemented by cutting down tissue needs, and strict curtailment of unnecessary movement and examination of the child was an important precaution.

At the same meeting Dr. H. G. Middleton emphasised that these children were likely to need many anæsthetics during their treatment, and familiarity with the anæsthetist (preferably in his theatre clothes during his visits between operations) was far better and often more effective than heavy premedication. He also referred to the high incidence of other diseases in children who are burned—complications which in normal circumstances would suggest postponement of anæsthesia and operation until they had been treated. But for the badly burned child, such complications must be accepted if life was to be saved. Indeed, as the result of his analysis of the deaths at the Welsh Regional Burns Centre at Chepstow, Dr. Middleton could exclude both anæsthesia and surgery as causes; in fact, he thought that they probably reduced immediate mortality.

Unlike those who are being treated for many other emergencies, the "very poor risk" burned patient must be accepted for anæsthesia early if the mortality is to be reduced. For the future, if the anæsthetist can keep his young patient alive during operation and immediately afterwards, then excision of full-thickness burns, even earlier than is commonly done nowadays, might become the best treatment. This would be a hard task, but the results would be even more rewarding than they are now.

THE LANCET AIR-MAIL EDITION

We now print a small proportion of our weekly issue on India paper for transmission to distant countries by air. The subscription rates for one year, inclusive of air-mail postage, are:

AUSTRALIA AND NEW ZEALAND .. **£13 13 0** (sterling)
UNITED STATES, CANADA, SOUTH AFRICA, AND INDIA .. .. **£11 11 0** (sterling)
OTHER COUNTRIES .. .. Quotations on request

THE LANCET, 7, Adam Street, Adelphi, London, W.C.2

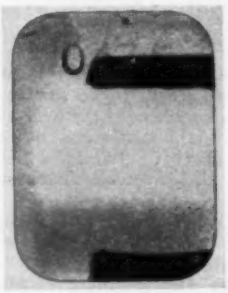
Special Articles

CASUAL EXPOSURE OF NURSES TO X RADIATION

B. E. GODFREY * B.Sc. Lond. ASSISTANT PHYSICIST
S. B. OSBORN B.Sc. Lond., A.Inst.P. PRINCIPAL PHYSICIST
DAPHNE J. TEMPLETON † M.S.R. RADIOGRAPHER
PHYSICS DEPARTMENT, UNIVERSITY COLLEGE HOSPITAL, LONDON

RADIATION-PROTECTION measurements in this hospital are largely carried out by means of film-badges, and those to whom they are issued include the nursing staff of wards where patients undergo treatment with radium and radio-isotopes. Most of these treatments are carried out in the special isotope ward, but occasionally such a patient may be nursed in one of the ordinary wards. It has been noticed for some time that film-badges returned from these wards may show exposure to diagnostic X rays as well as to γ rays.

The film-badge holder contains two apertures through which radiation reaches the end sections of the film, the centre portion being screened by a filter. As the film is set about 1 mm. behind the apertures, radiation from different directions will be recorded in slightly different positions on the film. We have found that exposure to diagnostic X radiation is usually at oblique angles. Further, an X-ray exposure, which is received in a short time and consists of low-energy radiation, appears as a clearly defined image, while γ-radiation in contrast appears as a diffuse image. The accompanying figure is of a film showing these effects, in which the X-ray and γ-ray exposures can be measured separately, the appropriate calibration factor being used for each. Very few films show exposure to both X-ray and γ-ray radiation, so that in general X- and γ-ray exposures are easily estimated separately. Table I summarises the information obtained from the film-badges issued in connection with radium and radio-isotope therapy over a period of 2 years.



It is clear that if such exposure of nurses is typical of the nursing staff as a whole, the total amount of radiation involved is considerable. Accordingly, an eight-week test was arranged for two wards nursing surgical and radiotherapy patients. The ward sisters knew that the object of the test was to ascertain the amount of diagnostic X radiation received by the nurses. The rest of the nursing staff were not informed of the object of the test, lest this knowledge should influence the result. During the eight-week period, a scalp treatment with a radium mould was carried out in ward A, and a colloidal radio-gold treatment in ward B, for which film-badges would have been issued in any case. Coöperation was excellent, and the results obtained are shown in table II. For comparison, similar data from other departments over a period of two years are shown in table III.

Doses Received

It is clear that the amount of radiation received is substantial, but it is unlikely that the results in table II are typical of the nursing staff as a whole. The two wards investigated nurse a substantial number of patients who have undergone major chest surgery, and many of them have chest radiographs taken in the ward repeatedly, although the amount of such work during this particular period of eight weeks was considerably less than average. If such an examination is undertaken in the few days following the operation, up to three nurses may be required to hold patient and film, and they are almost bound to be exposed to some of the direct beam of radiation. The extent of this is shown by the observation that 5 out of the 137 film-badges recorded more than 300mr in one week. That is, on average each nurse in these wards may expect to receive an occupational exposure of more than 300mr not less than 1 week in 28, or at least twice a year. Further, the average amount of radiation per nurse-week is about 20mr. The International Commission on Radiological Protection (1955) recommends that radiation workers should not receive more than 300mr per week where a substantial fraction of the body is irradiated. For large populations (i.e., groups of people not subject to the rigorous control specified for radiation workers) exposure should not exceed 30mr per week. On the average, this condition is just fulfilled. The average dose-rate of 20mr per week, as will be seen from table III, is considerably higher than that received by several groups of radiation workers in the same hospital.

On average, a nurse is unlikely to receive as much as 30mr per week (ward A, table II) or as little as 3mr per

TABLE I—ANALYSIS OF 575 FILM-BADGES WORN BY THE NURSING STAFF IN CONNECTION WITH RADIO-ISOTOPE AND RADIUM TREATMENTS, OVER A PERIOD OF TWO YEARS

Ward	No. of films issued	% of films showing exposure	Average recorded dose (mr.)	Average dose per nurse-week (mr.)	Number of nurses "at risk"
Isotope ward :	455	..	..	..	8
X radiation ..	..	6·2	44	3	..
γ radiation ..	..	59	10	6	..
Other wards :	120	..	..	..	800*
X radiation ..	..	13·3	77	10	..
γ radiation ..	..	33	20	7†	..

* Average number of nurses on *all* other wards who could be exposed to X radiation.
† Average γ-ray exposure per nurse-week during radium and radio-isotope treatments only.

TABLE II—ANALYSIS OF 137 FILM-BADGES WORN BY NURSES ON TWO SURGICAL WARDS DURING AN 8-WEEK TEST, WITH COMPARABLE FIGURES FOR THE ISOTOPE WARD FOR THE SAME PERIOD

Ward	% of films showing exposure	Average recorded exposure (mr)	Average dose per nurse-week (mr)	Highest individual average* (mr per week)	Highest recorded dose † (mr)	No. of times 0·3r per week exceeded
Surgical A :						
X radiation ..	33	89	30	220	350	4
γ radiation ..	4	123	5	45	220	..
Total	37	..	35	..	..	..
Surgical B :						
X radiation ..	24	35	13	40	320	1
γ radiation ..	19	18	5	25	80	..
Total	43	..	18	..	..	..
Isotopes ‡ :						
X radiation ..	2	10	..	..	10	..
γ radiation ..	71	10	8	10	30	..
Total	73	..	8	..	..	..

* Averaged for each nurse over all the dose measurements made on her during the 8-week test.
† Highest recorded dose for any single week.
‡ Figures taken for the same 8 weeks as for the other two wards.

* Now at the Royal Northern Hospital, Holloway Road, London, N.7.
† Now at the Marie Curie Hospital, London, N.W.3.

week (isotope ward, table I). The values of 10mr per week (other wards, table I) and 13mr per week (ward B, table II) are more likely to be typical. All γ radiation received by the nursing staff from radio-isotope therapy is accounted for, and over the whole group of 800 nurses amounts to an average of only 0·1mr per week. The X radiation amounts to about 10mr per week, and both these figures must be compared with the natural radiation level of about 2mr per week (Spiers 1956). No doubt the amount of X radiation could be considerably reduced

TABLE III—ANALYSIS OF 6160 FILM-BADGE RECORDS OVER A PERIOD OF 2 YEARS

Department	Average dose (mr per week)	Highest weekly average* (mr per week)	Highest dose in any one week (mr)	% of films recording at least 300 mr	Approximate no. of measurements	Approximate no. of staff
Isotope ward	9	30	80	..	460	8
Radiotherapy	10	30	800	0·4	800	14
Isotope laboratory ..	10	35	250	..	850	6
Physics	40	185	540	1·5	800	6
X-ray :						
Radiologists ..	40	400	800	2·5	950	12
Radiographers ..	120	400	800	7·5	1300	16
Student radiographers	40	140	440	0·5	1000	14
	Mean 50			Mean 2·5	Total 6160	Total 76

* Averaged over 13 consecutive weeks.

by accurate coning, but this is of necessity much more difficult in ward radiography than it is in the X-ray department itself. The extensive use of clamps and mechanical aids would reduce the need for the holding of patients and films by hand.

Deliberate Exposure

There is bound to remain the occasional case where a nurse must hold the patient or film. If, in such a case, radiological examination is essential, the nurse should be provided with a lead-rubber apron and lead-rubber gloves. There is no more valid reason for exposing a nurse to a primary beam than there is for a radiographer.

It has for long been the custom, in both diagnostic and therapeutic radiology, for the radiographer to ask relatives or ward nurses to hold a patient in the beam of radiation, where this is essential. This practice is clearly preferable to repeated exposures of the radiographic staff to the primary beam. It is presumably based on the assumption that exposure of the nurse or relative will be a relatively infrequent occurrence and the effects negligible. In view of recent evidence on radiation exposure levels in this country (Medical Research Council 1956), particularly the increasing number of diagnostic X-ray examinations (Osborn and Smith 1956) and the induction of leukæmia by radiation (Court Brown and Doll 1956), this practice may need to be modified.

We wish to record our thanks to Miss H. M. Downton, matron of University College Hospital, for her help in this work, and to Miss D. W. Cook and Miss J. G. Price, ward sisters, for their active collaboration. Miss I. Bull, M.S.R., gave invaluable help in the film-badge measurements.

REFERENCES

Court Brown, W. M., Doll, R. (1956) Medical Research Council Report. H.M. Stationery Office. Cmd. 9780, appendix B.
Medical Research Council Report (1956) The Hazards to man of nuclear and allied radiations. H.M. Stationery Office. Cmd. 9780.
Osborn, S. B., Smith, E. E. (1956) *Lancet*, i, 949.
Recommendations of the International Commission on Radiological Protection (1955) *Brit. J. Radiol.* suppl. no. 6.
Spiers, F. W. (1956) *Ibid*, **29**, 409.

JOINT CONSULTANTS COMMITTEE

A MEETING of this committee was held in London on Jan. 23, with Sir Russell Brain in the chair.

Medical Membership of Hospital Boards

Among the matters under consideration was a circular issued by the Ministry of Health on Dec. 31 informing hospital boards that the Minister had accepted the recommendation of the Guillebaud Committee that the medical membership of regional hospital boards should not exceed 25% of the total membership save in quite exceptional circumstances, and advising boards to observe the same principle in making appointments to hospital management committees. The Joint Committee had previously urged the Ministry that the membership of a regional board should include at least 5 consultants actively engaged in the region concerned, and in addition a general practitioner and a medical officer of health, all nominated by the profession. In a letter from the Ministry informing the committee of the Minister's decision it was stated that the Minister could not accept this proposal, but that he fully shared the committee's view that the medical members of the regional boards should consist primarily of active members of the consultant staff in the region, together with a general practitioner and a medical officer of health.

The Joint Committee was profoundly disturbed at the Minister's decision, the more so as it appeared inconsistent with his acceptance of the principle that the medical membership should consist primarily of active members of the consultant staff in the region, who are by no means well represented on regional boards at the present time. The committee thought it inevitable that the small number of consultants representative of those working in the regions must be still further reduced if the over-all number of medical members was to be reduced, while still including representatives of the universities and medical schools, and in addition a general practitioner and a medical officer of health.

The committee felt strongly that any reduction in the medical membership of hospital boards would, of necessity, effect adversely the valuable part played by the profession in the administration and planning of the service, and that to place upon a smaller number of doctors the responsibility of serving on the boards and their various committees would make the burden intolerable.

The committee decided, therefore, to ask the Ministry for an early opportunity of discussing the matter further. It decided also to discuss with the Ministry again the question of medical advisory machinery at regional-board level, in the light of the recommendations of the Guillebaud Committee, while making it clear that it did not regard such machinery in any way as an alternative to adequate representation on regional boards.

Hospital Medical Staffs

Representatives from the registrars group of the British Medical Association attended the meeting to put before the Joint Committee their views regarding the problems associated with hospital medical staffing as they affected the prospects of registrars and senior registrars. They pointed out that the salary scales recommended by the Spens Committee had been formulated on the assumption that consultant status would normally be reached at 32 years of age. At the present time, however, senior registrars in the main specialties did not usually obtain their first consultant appointment until several years later than this, with a consequent loss in their total life earnings of £1700 for every year promotion was delayed beyond the age of 32. They urged that the introduction of a new career grade below consultant status would not provide a satisfactory solution of the problem since it would permanently lower the total life earnings of a

proportion of new entrants into the hospital service. They recommended that there should be a gradual run-down in the number of senior registrars which would ensure reasonable prospects of promotion after an average training period of four years. Pending such a balance being obtained, and as a purely temporary expedient, they suggested that the tenure and salary scale of time-expired senior registrars should be extended, and newly appointed consultants given seniority on the incremental scale for every year over 32 at the time of appointment.

Appointments in Venereology

A deputation from the venereologists group committee also attended the meeting to discuss with the committee the difficulties experienced in the staffing of venereal-diseases departments in areas where there is insufficient work to make a consultant appointment in the specialty practicable.

Moral Obligation

The committee agreed to a proposal from the Ministry that the Appointment of Specialists Regulations should be amended to allow a consultant or senior hospital medical officer whose sessions are reduced, or whose contract is terminated through redundancy, to be offered an alternative appointment without the necessity to apply for the vacancy in open competition.

Hospital Private Beds

The question of the steadily rising charges for hospital private beds was discussed and the committee decided to prepare a case for the introduction of a moderately priced private bed. Reference was also made to the many anomalies in the schedules of operations contained in the Pay Bed Regulations, and instances were quoted of the way in which these schedules operated to the disadvantage of the patient rather than to his advantage. It was agreed to submit a reasoned case to the Ministry for the abolition of the schedules.

Other Matters

Among other matters discussed were the shortage of radiographers and physiotherapists, domiciliary consultations by pathologists, the attendance of chairmen of hospital group medical advisory committees at meetings of hospital management committees, and the payment of fees for the examination of prospective employees at the request of employers.

N.H.S. SUPPLEMENTARY ESTIMATE

ACCORDING to the Supplementary Estimates,[1] published last week, a further £26,872,700 will be needed for the National Health Service in Britain in the present financial year. This brings the net total cost to £529,014,830. An additional £15,008,000 is needed by hospital authorities, mainly to cover increases in remuneration, prices, and rates. For the pharmaceutical services an additional £8,089,000 is needed, despite the change in charges (from Dec. 1 last) from 1*s.* per form to 1*s.* per prescription. The estimated total of payments to general medical practitioners is increased by £2,946,000, and that of payments to general dental practitioners by £1,635,000.

1. 1956–57, Supplementary Estimate: Civil Estimates and Estimates for Revenue Departments. H.M. Stationery Office. Pp. 223. 8*s.* 6*d.*

Public Health

MORTALITY: A CHANGING PATTERN

J. A. FARRER
M.B. Melb.

RECLINING peacefully in many a village church are records which go back many years before the introduction of our more up-to-date registration statistics.

When we speak in terms of advancement in ways of living, with what are we comparing the present day? In fact what, in our present day, are we to compare? Are we to compare recent statistics with past impressions, or do we put our impressions into statistics and compare them with the impressions of the great novelists?

Because of the high proportion of intangibles, there are many difficulties in the way of anyone wishing to project the past on to the present. However, from the following, relatively small, exercise, I wish to draw attention to possibilities which others, more skilled than I and with access to more extensive records than I, may care to follow up.

The material consists of the record of burials performed in a very rural Dales village.[1] At first sight the books, with their parchment pages, appear only relevant to those wishing to seek information on the whereabouts of their ancestors. But, from the year 1804, the ages at death have been inserted, and it is from that time that my tables have been constructed.

The first nine years' recording is somewhat more interesting in that the diagnosis has been inserted.

Tables I–III show the number of deaths in each age-group, the percentage which this number represents of the total deaths in this period, the actual numbers of male and female deaths, and the ratio of male to female deaths. Table IV shows the deaths in 1953 in the whole

1. Church Records. Clapham-cum-Newby Parish Church, 1804–63.

TABLE I—DEATHS IN CLAPHAM-CUM-NEWBY (1804–12)

Age-group	Total	% of total	Males	Females	Ratio males : females
0–5	66	20·2	35	31	53 : 47
5–10	12	3·7	4	8	33·3 : 66·7
10–20	30	9·2	15	15	50 : 50
20–30	23	7·1	9	14	39·1 : 60·9
30–40	24	7·2	10	14	41·6 : 56·4
40–50	23	7·1	12	11	52 : 48
50–60	20	6·1	9	11	45 : 55
60–70	30	9·2	19	11	63·4 : 36·6
70–80	52	15·9	24	28	46 : 54
80–90	39	11·9	17	22	43·6 : 56·4
90–100	8	2·4	6	2	75 : 25
	327				

TABLE II—DEATHS IN CLAPHAM-CUM-NEWBY (1813–37)

Age-group	Total	% of total	Males	Females	Ratio males : females
0–5	153	17·1	82	71	53·6 : 46·6
5–10	27	3·0	10	17	37 : 63
10–20	72	8·5	29	43	40·3 : 59·7
20–30	79	8·8	43	35	54·5 : 45·5
30–40	60	6·7	35	25	58·4 : 41·6
40–50	48	5·5	17	31	35·4 : 64·6
50–60	78	8·2	32	46	41 : 59
60–70	106	11·8	45	61	42·4 : 57·6
70–80	157	17·5	77	80	49·1 : 50·9
80–90	104	11·6	49	55	47·1 : 52·9
90–100	10	1·1	5	5	50 : 50
	894				

TABLE III—DEATHS IN CLAPHAM-CUM-NEWBY (1837–65)

Age-group	Total	% of total	Males	Females	Ratio males : females
0–5	190	21·3	102	88	53·7 : 46·3
5–10	37	4·2	22	15	59·4 : 40·6
10–20	69	7·8	33	36	47·9 : 52·1
20–30	82	9·2	38	44	46·4 : 53·6
30–40	55	6·2	23	32	41·8 : 58·2
40–50	51	5·8	19	32	37·3 : 62·7
50–60	61	6·9	28	33	45·9 : 54·1
60–70	106	12·0	49	57	46·2 : 53·8
70–80	148	16·6	78	70	52·6 : 47·4
80–90	81	9·3	38	43	46·9 : 53·1
90–100	7	0·8	6	1	85·7 : 14·3
	887				

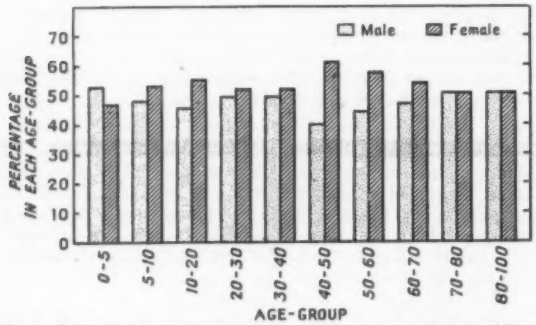


Fig. 1—Ratio of male to female deaths in Clapham-cum-Newby (1804–1865).

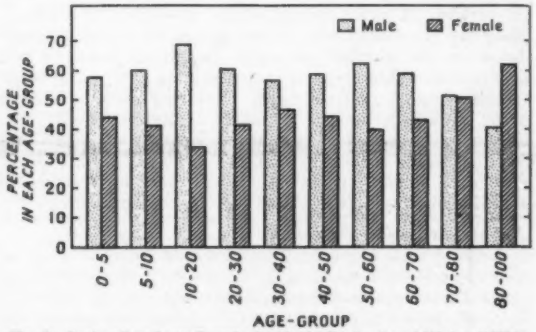


Fig. 2—Ratio of male to female deaths in England and Wales (1953).

country,[2] From the totals in tables I–III, fig. 1 was constructed. This shows:

1. In most age-groups, female deaths predominate, the exceptions being a reversal in the first age-group and equality in the last two.
2. The only considerable sex-difference is in the age-groups 40–50.
3. The sex-difference in the age-groups 20–40 is comparable with the total sex-difference (48·4 male to 51·6 female).

TABLE IV—DEATHS IN ENGLAND AND WALES (1953)

Age-group	Total	% of total	Males	Females	Ratio males : females
0–5	21,528	4·21	12,244	9284	56·7 : 43·3
5–10	1763	0·33	1043	720	59·2 : 40·8
10–20	2899	0·575	1769	1130	61·0 : 39·0
20–30	5967	1·18	3572	2395	59·8 : 40·2
30–40	10,132	2·01	5517	4615	55·5 : 45·5
40–50	24,738	4·9	14,120	10,618	57·4 : 43·1
50–60	54,994	10·9	33,711	21,283	61·2 : 38·8
60–70	105,160	20·9	61,094	44,066	58 : 42
70–80	159,165	31·5	79,806	79,359	50·2 : 49·8
80–100	117,183	23·2	46,614	70,569	39·7 : 60·3
	503,529				

Table IV, as prepared for 1953, has been represented in fig. 2. The first item of note is, of course, a reversal of the proportion of male to female deaths. Secondly, the whole pattern of ratios has changed.

Lastly the tables have all been combined to show the changing pattern in another aspect (fig. 3). This figure is based on the third column of the tables: I, II, and III are reduced to a single set of figures represented by the white portions, and table IV is represented by the black portions.

This bears out the general impression that mortality during the earlier years, particularly the first year of life, has been reduced.

2. The Registrar-General's Statistical Review of England and Wales for the year 1953. Part I—Medical. H.M. Stationery Office, 1954. Table 15.

TABLE V—CAUSES OF MORTALITY IN CLAPHAM-CUM-NEWBY (1804–12)

Age-group	0–5	5–10	10–20	20–30	30–40	40–50	50–60	60–70	70–80	80–90	90–100
Stone, gravel	..	..	..	..	..	..	1	..	2	..	..
Consumption, asthma	2	1	16	13	13	8	5	7	1	..	..
Infirmity	1	..	..	..	..	..	..	17	38	36	9
Sudden death	..	..	1	1	1	1	2	2	1	..	..
Chincough	4	..	..	..	..	..	..	..	..	..	..
Dropsy	..	..	..	..	1	2	3	4	3	..	..
Convulsions	20	..	..	..	..	..	1	..	..	..	..
Fever in brain	..	..	1	..	1	..	..	..	..	..	..
Accidental death	1	2	1	..	1	2	1	..	1	..	..
Weakness	28	..	1	..	..	..	..	1	..	..	..
Fever	2	2	4	4	2	2	..	..	..	..	..
Inflammation of bowels and cramp in stomach	1	2	..	1	1	3	1	..	1	..	..
Childbirth	..	..	..	1	..	1	..	..	..	..	..
Smallpox	2	5	4	..	..	..	..	..	..	..	..
Palsy	..	..	..	..	..	1	..	..	1	..	..
Pleurisy	..	..	..	..	..	..	..	..	1	..	..
Cancer	..	..	..	..	..	2	..	..	..	..	..
Rheumatism	..	..	..	..	..	..	3	..	..	..	..
Inflammation of throat	2	..	..	..	..	..	..	..	1	..	..
Joint disease	..	..	1	1	1	..	..	..	..	..	..
Epileptic fit	..	..	1	..	..	..	..	..	..	..	..
Ague	..	..	..	1	..	..	..	..	..	..	..
St. Anthony's fire	..	..	..	..	1	..	..	..	..	..	..
Broken leg	..	..	..	..	..	..	..	..	1	..	..
Gangrene	..	..	..	..	..	..	..	..	..	1	..

Discussion

When I began to examine these records I had very little idea whether anything of interest could be obtained. But by the time the first three tables had been prepared, it became evident that, in spite of the relatively small numbers, there was a consistency in percentages (third column) over the years taken. This consistency is also present, though not so exact, in the final column (ratio of males to females).

This pattern, I felt, could best be expressed in comparison with the present-day figures shown in fig. 3 but needed a rearrangement of the numbers for 1953 to make the scale comparable.

When these had been completed, the next point meriting attention was the recording of the years 1804–12—the only years for which a diagnosis of the cause of death was recorded. When the record had been prepared, it was evident that, though it was extremely interesting, no actual conclusions could be drawn.

I had always thought that the rigours of childbirth had contributed largely to the mortality of the early 19th century yet in this series of some 327 deaths, only 2 were directly attributed to childbirth. We must, of course, be careful in drawing general conclusions because medical knowledge has increased, but the records of births

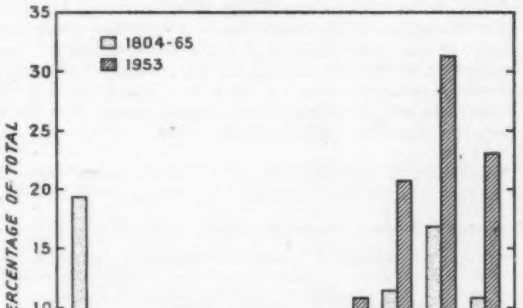


Fig. 3—Ratio of deaths in Clapham-cum-Newby (1804–1865) to deaths in England and Wales (1953).

confirm that the small number of deaths in childbirth may well be accurate.

Figs. 1 and 2 show the pattern of male and female deaths for the period 1804–65, as compared with 1953. There is an alteration in the pattern which is hard to explain. Part is, of course, accounted for by the fact that we are living in an era of more male births, in Clapham as in the rest of the country.

Perhaps others may care to comment, or search.

My thanks are due to the Rev. C. T. Foster for permission to examine the records.

Before Our Time

Thomas Lawrence

At a meeting of the Osler Club held at the Royal College of Physicians on Jan. 24, with Dr. W. S. C. Copeman, president of the club, in the chair, an address on Dr. Thomas Lawrence was given by Sir Russell Brain, P.R.C.P.

Lawrence, he said, was born in 1711 into a family which played some part in national affairs from the middle of the 16th to the beginning of the 19th century. His grandfather was physician to Queen Anne, and his father a captain in the Royal Navy. Thomas Lawrence went to Trinity College, Oxford, decided to take up medicine, and became a student at St. Thomas's Hospital and a pupil of Dr. Nicholls, the popular lecturer in anatomy, whom he succeeded in that position at Oxford. He also lectured in anatomy in London until he was displaced by the popularity of Hunter. He then devoted himself to practice, and occupied numerous positions at the Royal College of Physicians, being elected president in 1767.

The college library contains a number of Lawrence's works, both Latin and English. Perhaps the most interesting is the *De Natura Animali* to which has been attached the manuscripts of Dr. Johnson's corrections of Lawrence's Latin. Lawrence's knowledge of anatomy is illustrated by his lectures, and his philosophical outlook by his discussions on the relation between the mind and the body.

His election as president took place during the turmoil of the famous siege of Warwick Lane, when the Society of Collegiate Physicians, in protest against the tradition that only graduates of Oxford and Cambridge could become fellows of the College, broke in by force and attempted to take their places in comitia.

Lawrence is known to us chiefly because of his friendship with Johnson, whose medical attendant he was. Both Johnson's letters and Mrs. Thrale's writings contain numerous references to him. Both men were in failing health when Mrs. Thrale accompanied Johnson to consult Lawrence who had that morning had a slight stroke. She gives a graphic account of the interview. Lawrence, who had suffered from angina as well as repeated slight strokes, retired from practice to Canterbury in 1782, and died there in the following year. He was buried in the church of St. Margaret, and a memorial tablet, with a portrait in relief, was placed in Canterbury Cathedral by his surviving children.

Seeing Lawrence through the eyes of his contemporaries, we can construct a fairly complete picture of his personality. He was a gentle, scholarly man whose hobbies were building model boats and playing the cello. "In his endeavours to attain to eminence," writes Hawkins, "it was his misfortune to fail: he was above those arts by which popularity is acquired and had besides some personal defects and habits which stood in his way: a vacuity of countenance very unfavourable to an opinion of his learning or sagacity, and certain convulsive movements of the head and features that gave pain to the beholders and drew off attention to all that he said."

This address will appear in *Medical History* (see p. 381).

The Widdicombe File

XXXVIII. CURRICULOSIS

Dear James,

My fraternal greetings. I write to you however not as a brother but as, since your last Widdicombe, an accepted authority on the curriculum. The G.M.C. is thinking of relaxing its dead and iron hand and the Royal College of Physicians has set up its conference on medical education. I hope they have had the sense to include you.

The old war-cries will soon be filling the air again—integration, correlation, the holistic approach, the basic validity of the doctor-patient confrontation and so on and so on. Like you, I sniff the battle from afar and long to be doing; but, compared to you, I may not be quite so well pleased to have my piece listened to. I began to compose you a memorandum, on such delectable topics as the need to retain the sixth year, and the introduction of a sixth-year multiple-option honours course for those who can complete the ordinary course in five years, and the black heresy of those who regard morbid anatomy as a dead subject. But I became a little discouraged after a while: all these things had been said before, and anyhow what did it matter? How much does the curriculum affect what we teach and what the student learns? I begin to believe that it matters a good deal less than the disputants pretend.

Don't get me too far wrong. Anyone who puts forward the current curriculum of any British medical school as an ideal which couldn't be improved is an idiot. But I want to put forward some arguments, which are, I think, at least in part a poor thing, an ill-favoured thing, Sir, but mine own, for the view that the curriculum has far less influence on the final content of the student's head (which is after all what matters) than we generally assume. And the gist of the argument is simply this: that this final content of the student's head reflects most closely not what his teachers taught him of their own subjects, but what they taught him of every subject but their own.

Let me take your own subject of bacteriology. We and you and most schools take a middle-of-the-road view: we teach a middling amount of bacteriology near the middle of the course. But if we were radically minded we could find arguments for putting bacteriology anywhere in the course from preregistration to final year. You could I am sure find excellent grounds for supporting a proposal to devote a full year of the medical course exclusively to microbiology: I could on the other hand find excellent grounds (the proper study of mankind is man) for excluding it, as a separate discipline, from the course altogether. I don't want to consider these arguments: what I want to suggest is that, whether you taught bacteriology for three solid terms in the second year or I confined you to three optional lectures on epidemiology in the final year, the end-result would not be so very different.

You teach your bacteriology—and remember again that I'm taking this subject only as an example—to your students, James, in three principal ways. There's the direct, the lectures you give yourself. There's the deputy-direct, by which I mean the lectures and practical classes and seminars given by your deputies, the junior members of your own department. And there's the indirect, the bacteriology that reaches them through those of their teachers who are not bacteriologists.

It's not difficult to show that the second is more important than the first. Partly it's quantitative: unless you're grossly understaffed your students will see far more of your juniors, and in far smaller groups,

than they do of you: no matter how much more practised and eloquent a teacher you are you are unlikely to overcome the sheer weight of numbers. But there's a more subtle factor. Your efficiency and your stature make what you say, however you strive against it, an Olympian utterance—something that must be true, something to be memorised rather than thought about. Your rawest demonstrator is to the student someone human who can be wrong, who can be challenged and questioned. The material he presents is only half digested and the very effort the student makes to digest it himself, though it wastes most of it, means that some will stick and stick for ever. And so it comes about, James, that what you teach that same raw demonstrator is far more important than what you teach your students yourself.

The importance of the third kind of teaching is perhaps not so evident. But it works out I think something like this. What you or even the youngest of your assistants teaches has always about it, however hard you try to get away from it, a faint aura of professionalism and laboratory unreality. This isn't what proper doctors think, this is just what bacteriologists think. It's to be swotted up for 3rd M.B., then forgotten as soon as possible. What is remembered, and remembered long after 3rd M.B. and Final as well, is the odd occasion on the ward when the report from the lab. is awaited anxiously, when the textbook mumbo-jumbo of *B. thingumibobbii* and rising titres and falling sensitivities proves to mean something in terms of handling the patient, and when the clinician turns out to understand more than a little of what it is all about. *That* part of bacteriology seems at once significant, something to hold on to. And the same thing applies to other subjects. Certainly to pathology—it's not what I teach them but what the surgeons and physicians and anatomists and bacteriologists teach them that sticks best. Even among the clinicians it applies: the smatterings of surgery retained by the physicians and of physician's medicine by the surgeons, the cardiology of the urologist and the neurology of the obstetrician, these irreducible minima of knowledge that seem to the student to be possessed by all his teachers, it is these that—rightly enough when you come to think of it—he regards as the irreducible minima of what he must learn himself. If Sir Daniel Whiddon knows about the Nagler reaction, it must be important: if not, who is the student to set himself up as better than Sir Daniel? And, *per contra*, if you or I don't know the difference between a Billroth I and a Billroth II, why should he worry about it?

There is a corpus of knowledge in every medical school, a highest common factor in the knowledge of all its teachers, that is by far the biggest single factor in forming and in stocking the minds of the students we produce. It is repeated to him again and again under different disguises by different teachers (the Bellmen crying "what we tell you three times is true") and cannot but sink in. It is a prime responsibility of every member of the staff to see that this corpus is kept alive and true and reasonably up to date. To contribute effectively to this corpus you need three things: you must have knowledge to contribute, you must have contact with the rest of the staff, and you must be successful as a practitioner of your own particular trade.

The last is important. The doctrines of the surgeon or physician whose patients do not get well, of the pathologist or radiologist whose diagnoses need too frequent revision, are always suspect. It is in this that one of the chief dangers of the "pure" research-worker in charge of a department lies. His colleagues, unable to judge him by the pragmatic test of the success of his ideas in practice, are slow in learning to trust him as a source of information. If he's outstandingly good of course, bridges will in time be built. But in general a department devoted to pure research is almost as dead a loss to its medical school as one that does none at all. (I think this even applies to the preclinical departments, which ought *somehow* to be brought into the hospital; but that is another story.)

The value of clinicopathological conferences and the like lies chiefly in their hot-house forcing of this corporate knowledge in the staff of the school. A student audience is only an excuse for a C.P.C.: it's the staff (on both sides) who are really educated.

In this respect a medical school mirrors on a smaller scale the university of which it is a part. You can have a university with no students, but you cannot have a university with less than three faculties. The interchange of ideas between different disciplines is infinitely more important to the idea of a university than extremes of accomplishment in any one of them. Moreover, though any cram college can teach students after a fashion, only a university can teach teachers. It is a self-propagating enzyme system (that is the reason for its immortality): the proper nurture of its brighter entrants to take the place of their teachers is its one altogether inescapable function. The teaching of the rest of the students is merely a valuable by-product. They come to warm themselves at a fire they will never feed.

As the head of a university department you have five main duties (I leave out administration, for that is only a means to the other ends). The first and chief is to be a good bacteriologist yourself. The second is to teach your staff to be good bacteriologists in their turn. The third is to communicate a distillate of your knowledge to your colleagues in other departments. The fourth is to join in the education of whatever students come before you, adapting your instruction to the stage of their progress through the curriculum (remembering that, if there's anything in what I've just said, it's the interlarded fragments of pathology and pædiatrics and plumbing that they will remember best). The fifth and last and leastest, is to arrange the base details of that curriculum.

The reorganiser of the curriculum is like a time-and-motion engineer in a watch factory: he can save time, and produce a cheaper watch, but he cannot produce a better watch. A reorganised curriculum may save time and energy, but it will not alter what is in the teachers' heads: and it is what flows out of the full head of the teacher into the empty head of the student that matters, not the channels we contrive for the flow.

You may say that in one respect the curriculum may circumvent this; if it cannot affect the contents of the head of the individual teacher, it can decide which teachers are to do the teaching. It's partly true of course: by adding or subtracting subjects we add or subtract teachers. But even that is not as decisive as it sounds.

Consider an extreme example we've already cited. If you captured a whole year of the course for bacteriology, you'd get wonderful results in 3rd M.B., but six months later you'd find it nine-tenths forgotten (just as now you can watch recent victors of 2nd M.B. visibly stripping themselves of superfluous anatomy till they arrive at the level their teachers of the clinical years seem to find adequate). But if, on the other hand, you were not allowed to teach any bacteriology, teachers of other subjects would find they had to introduce it into their own courses. (As once at school, our maths being behindhand, our chemistry master taught us logs and our physics master nearly got us as far as calculus.) Except for a few enthusiasts the first method would give you, the end-results wouldn't be as grossly divergent as you

might suppose. Bacteriology is a necessary part of medicine; in that respect it arranges for its own teaching.

It is much the same with new subjects. If they are good and live and genuine they edge their way in willy-nilly. Students listen avidly, teachers find it profitable to display their erudition on something outside their usual sphere. The best registrars suddenly start side-stepping into the novelty, and in self-defence the school has to appoint someone to its staff to take care of it. It is being taught as much as it deserves usually long before the curriculum has even noticed it exists.

Good luck to your discussion, James; I'm sure the grand debate will be the better of your contribution. But don't waste too much time on it. Remember only, as the Inquisitor nearly said, that bacteriology comes first.

Yours,

PETER DAVEY.

Parliament

Capital Punishment

ON Feb. 1 the debate on the first private member's Bill of the day—a measure for the control of hire-purchase advertisements—lasted for five hours. As a result of this exhaustive discussion the private member's Bill to abolish hanging lost its slender chance of survival. On Feb. 6 the third reading of the Government's Homicide Bill, which restricts but retains the use of capital punishment, was carried by 217 votes to 131, and sent to the House of Lords.

In introducing the third reading Mr. R. A. BUTLER, in his first speech as Home Secretary, said that the new defence provided in clause 2 would enable the courts to take account of the great strides that had been made in the understanding of the human mind, and to avoid treating as murder killings for which the accused ought not to be held wholly responsible. This was part of the new approach to the problems of the mind which he thought would exercise both the Home Office and the House in the coming months and years. He believed that the unexplored territory of the mind would be perhaps one of the most exciting of the adventures before the human intellect in the years to come, and as important in our relationships in the human sphere as nuclear development in the scientific. He hoped that he might have the support of the House in any further moves in this direction in the humanising and understanding of relationships, whether in crime or in the other spheres for which he was responsible.

In the course of the debate Dr. REGINALD BENNETT returned to this clause about which he confessed he felt uneasy. The new code on diminished responsibility seemed to him in conflict with the McNaughten rules yet the rules had not been abolished. He feared that the courts in future would be baffled which of these mechanisms was to be invoked in murder trials. If there was a prima-facie abnormality of mind did a charge of murder still stand? Or, if it was evident from unopposed medical evidence before a trial came to pass that the prisoner's mental condition was in other ways deranged, did the indictment drop to that of manslaughter? If there was a charge of murder, must the outcome of the charge be either that the prisoner was unfit to plead on arraignment—that he was guilty or not guilty or that he was guilty but insane—or was there the further alternative, when the charge was murder that he was guilty of manslaughter? Or did he really go for trial on a charge of manslaughter to which he could be guilty or not guilty?

An even greater difficulty, Dr. Bennett suggested, was to decide on what basis and to what degree there was irresponsibility. The provision in clause 2, was whether the accused

"... was suffering from such abnormality of mind (whether arising from a condition of arrested or retarded development of mind or any inherent causes or induced by disease or injury) as substantially impaired his mental responsibility for his acts and omissions ..."

Against that we had the McNaughten rules, which asked whether the accused was suffering at the time from such a defect of mind as to be unable to appreciate the nature of his act or the fact that it was wrong. Which of these two standards came first? Did one supersede the other? Might it be assumed that in future in cases of homicide there would be no consideration of the McNaughten rules? The point was important because if the McNaughten rules applied, a man found to be suffering from a defect of reason would go to Broadmoor which was automatically an indefinite sentence. If, however, his defect of mind was found to be one which justified a sentence for manslaughter, there would be no consideration of any treatment for his mental state except such as is incidental to an ordinary term of imprisonment.

In winding up the debate Mr. J. E. S. SIMON, the joint under-secretary of State for the Home Office, said that the Bill provided a criterion which took cognisance of the fact that there were, humanly speaking, many degrees of mental responsibility for crime. Till now the only legal criterion of mental responsibility for crime was provided by the McNaughten rules, and unless that rigorous test was satisfied, the death sentence was passed. The Home Secretary, in deciding whether to recommend that the sentence should stand, applied a different test and one not prescribed by the law. The Bill went far to reconcile that divergence.

Turning to Dr. Bennett's question as to the relationship between the two defences, Mr. Simon said that the accused man might, on the face of it, be unfit to plead. That was generally a matter which was initially determined by the prosecution, though it might be raised by the defence, and a jury was then empanelled to decide whether the man was fit or unfit to plead. It was only if the man was fit to plead that any question of these defences arose, and then it was a matter for the man. The prosecution could not raise any question at that stage as to his mental responsibility for the crime. It was for him to say whether he would raise a defence which would lead to a verdict of "Guilty but insane" or whether he would raise the sort of defence which would lead to a verdict of manslaughter by raising a question of diminished responsibility. The one was under the McNaughten rules. It was a complete defence and the verdict was guilty but insane, which was equivalent to not guilty. The diminished responsibility defence would lead to a verdict of guilty but guilty of manslaughter. For this the sentence was not necessarily a fixed term. It was a matter for the judge's discretion, on the evidence that was then given to him after the verdict, as to whether he passed a sentence for life if he could not determine the time necessary successfully to treat the prisoner. He could sentence the convicted man to a term of years. Equally he could, if he wished, put him on probation for the crime of manslaughter, and he could make a condition of the probation in a proper case that the man should submit himself to psychiatric treatment, or, indeed, any other medical treatment for a suitable time.

Domiciliary Services for Old People

On Feb. 6, under the ten-minute rule, Mr. FRANK MCLEAVY introduced a Bill to amend section 31 of the National Assistance Act, 1948, so as to empower local authorities to provide meals and domiciliary and other facilities for old people.

QUESTION TIME

Supplementary Estimate

Mr. ARTHUR BLENKINSOP asked the Minister of Health how much of the Supplementary Estimate for the National Health Service was due to an increase in the number of medical and other staff of our hospitals.—Mr. DENNIS VOSPER replied: None. Provision for staff increases was made in the original estimate. With insignificant exceptions, the extra expenditure on hospital-running costs provided for in the Supplementary Estimate is in respect of increases in pay, prices, and rates.

Number of Prescriptions

Mrs. L. JEGER asked the Minister the number of prescriptions dispensed during the first month of the new charges, and the number for the corresponding period last year.—Mr. VOSPER replied: An accurate figure is not yet available. From a representative sample it is estimated that the number dispensed in England and Wales during December, 1956, was of the order of 15·5 million. The total number in December, 1955, was 19,349,115.

Dental Hygienists

Mr. BARNETT JANNER asked the Minister, as representing the Lord President of the Council, whether he would make a statement on the availability of dental hygienists for the general public in accordance with the provisions of the Dentists Act, 1956.

Mr. VOSPER replied: Some dental hygienists are already employed in the local-authority and hospital dental services, but they cannot work with dentists in private practice until permitted by regulations made under the Dentists Act, 1956, by the General Dental Council. The General Dental Council has asked the Privy Council to approve draft regulations which provide that dental hygienists shall not be allowed to work in private practice until such time as the requirements of the local-authority and hospital dental services are, in the opinion of the General Dental Council, satisfied. This limitation would not appear to accord with the intentions of Parliament as expressed during the passage of the Bill and the proposals have therefore been referred back to the General Dental Council for further consideration.

Fees for Poliomyelitis Vaccination

Mr. Moss TURNER-SAMUELS asked the Minister of Health whether, in view of the fact that the remuneration of general practitioners for the carrying out of the responsible duties and complicated arrangements required to collect, store, and administer the vaccine and keep the necessary records in connection with inoculation against poliomyelitis was unreasonably low, he would increase the present inclusive fee of 5*s*. for the two inoculations required in each case to a more reasonable figure.—Mr. VOSPER replied: The vaccination will be performed as part of the general practitioner's comprehensive medical care of his patients for which he receives remuneration from his local executive council; the additional 5*s*. fee is to be paid by the local health authority for the record of vaccination. This is the present fee for records of other forms of immunisation and was agreed between representatives of local authorities and of the medical profession.

Overseas Dental Students

Mrs. HILL asked the Minister of Health how many students at present in British dental schools are from the Commonwealth and how many from foreign countries; and how many he estimates will practise in this country after qualifying.—Mr. VOSPER replied: The numbers from Commonwealth and foreign countries in English dental schools are 109 and 113, respectively. I cannot estimate how many will practise in this country after qualifying.

Senior Medical Inspector of Factories

Sir LESLIE PLUMMER asked the Minister of Labour if he would now improve the grading of the post of H.M. Senior Medical Inspector of Factories, to reflect more accurately the importance attached to industrial health organisations and equated with the grading of the chief medical officer of the Ministry of Pensions and National Insurance and of the Colonial Office as well as with the Treasury medical adviser.—Mr. IAIN MACLEOD replied: No. The present grading of the post of H.M. Senior Medical Inspector of Factories is based upon the recommendations of the Howitt Committee which reported in 1951. The salary has been adjusted in accordance with the recommendations of the Royal Commission on the Civil Service.

Occupation Centres for Mentally Handicapped

At the end of 1955, 12,372 mentally handicapped people were attending occupation centres and 7877 others, mostly adult, were reported by local authorities to be suitable to attend when places could be provided. At the end of 1956 there were 301 centres in full-time and 69 in part-time use. Schemes for 41 full-time centres have been approved, and these may be expected to be working in the course of the next two years. Proposals for 33 others are being considered.

In England Now

A Running Commentary by Peripatetic Correspondents

YOU might think that transplanting a couple of gooseberry bushes a simple operation? Not in our garden. I was poised with my fork when the dustmen arrived and amongst them my old patient Tom Hoggart.

"Are t' movin' goosegogs, doctor?"

"Yes, into the orchard, Tom."

"Thou'lt send 'em to their grave."

"Eh?"

"Th' acid in t'ground. They might show first year, small an' 'ard. Followin' year they'll wither down. Th' acid 'll draw 'em down to t'root ends."

At that moment my wife came rushing out of the house, her hands and arms white with flour.

"You're not moving the gooseberry bushes are you?"

"Why not?"

"Every time anything looks as though it's going to take a hold in this garden you decide to move it. Even weeds can't grow here, they haven't time."

"Relax, honey-child. In three years these two bushes have produced five hard, hairy goosegogs. They need a new start. And that's what I'm giving them!"

"It will be the children next," she said. "You'll be sending them to boarding-school."

As our eldest child is only 3½ I considered this a remark of quite tangential irrelevance and was about to say so when Mr. McGillivary, the smith, walked by. I was in need of an ally.

"Moving the gooseberry bushes, doctor?"

"He's *always* moving *everything*," said my wife. "Every time I come out into the garden the plan is changed. I never know where to look for things."

"And isn't that what the ladies do in the house?" said Mr. McGillivary. "When a man wants his pipe or his slippers or a piece of string or his screwdriver where are they? Moved!"

I smiled on Mr. McGillivary. Not for nothing had we thrown together the companionable dart at the *Golden Ball*. I looked towards the orchard.

"Where would you put them, Mr. McGillivary?"

"In the orchard. The ground is sweet under the apple trees, and when summer comes their skins will be bursting with sugar."

* * *

The Church, the Army, the Law, and Medicine are all in their way connected with death. The cloth discusses it, the warrior arranges it, the solicitor is ready for it, the doctor delays it (or tries to do so). These lugubrious conclusions arose from my recent visits to the third of these fell sergeants. The man of law's touch was so light. His remarks were far removed from the forebodings of the post-Victorian revivalist. He spoke of some far-off divine event. When the event happened, you, me, the client would be obviously performing a gracious act (gracefully), and he was armed at all points cap-à-pie to carry on the good work with all propriety. How comforting a speculation. Everything prepared for. Nothing, or only very little, to go wrong.

Part of the solicitor's finesse comes from good training, from those articles, not the thirty-nine, for which as a penurious father I have just paid so much, but part surely from the fact that the lawyer acts after life, and the parson, the colonel, the doctor during life. When the Law is in action during life its mills grind as slowly as those of God, its results may be as uncertain or as foggy as the case of Jarndyce *v.* Jarndyce.

If our profession could be as futuristic as the family solicitor is, how different it would be. Luckily I suspect for ourselves, we are continually being held up to the ransom of necessary decision, and some of us can shut our eyes like the fighting man guided by some higher command, or like the cleric call upon some vision which not all mortals can share with him. The sword of Damocles hangs by its thread; in Lincoln's Inn it has

already fallen. For us there are minefields everywhere: the lawyer in his bulldozer is engaged in a mopping- and chopping-up proceeding.

* * *

Yesterday during my matutinal period of reflection, my eye lighted on the rhythmically stamped cylinder of "Government Property" by my side, and I fell to thinking of the wonderful effect that slight and insistent propaganda can have. Of all the expensive apparatus owned by the State, this cheap roll is the most jealously labelled. Is this the source of our nation's difficulties? How little does H.M. Government understand the psychology of advertisement; how poorly does its material and site compare with that of the meanest drug-house! It is causing us to lose the respect we should have for things not our own. We are being conditioned to throw down the drain what Whitehall has marked as its own.

It may be the concern of Dr. Hill in his new office to deal with this, lest the products of Government action block our national waterways and sewage canals. No doubt the Ministry of Health will suggest that a shilling charge be put on each dispensation. Lucky numbers and a monthly draw for tax-free prizes might overcome opposition to this, while some will be hoping that the discovery of an imperforate roll will bring the rewards of an imperfect sheet of stamps.

* * *

WEST OF SUEZ

The Healthman's Moane

Whan that a manne thinketh that his foode
Is full of dirt and maybe is not goode,
Or mayhap feeleth that a piece of meat
Is froght with danger unto him that eat,
Or if it seemeth that a dung or spitt
Be full of Microbes lurking to transmit
The seeds of evil stynking of disease,
Whether it come from home or overseas,
Or if perchance 'twere that a mouse or ratte
A miller's flour or grain sacks has been atte,
There is a way vouchsafèd whereby hee
May bring the noxious thing along to mee.
It must in sooth be carried straightaway
For urgent matters can brook no delay;
Therefore do I affix to it a tabbe
And bear it instantly unto the Labbe—
A mean and sorry place of no great wealth
But natheless a proppe of public health
Wherein men using alchemy and smell
Can tell us whether bodeth ill or well
Each thing pertaining to the nation's meat
And drink withal, a veritable feat.
The Labbe's kindly folk will do their best
To find if therein harbour plague or pest.

When Healthmen find that they can get the juice
They put the Labbe to quite a bit of use.
Needs must they get the wherewithal to go
But now the edict sayeth nay not so.
A most disastrous tragedye indeed
Withholding from him what he sorely need,
But unto such enactments must one bow
By using only what the law allow.
Where Healthman's duty lieth in a towne
His channels may not be so greatly downe,
But when amid the hills his places lie
In sooth can he but stand aside and sigh.
Meseemeth it accordant to reasoune
The country Healthman is a sorry loone
For lo, perforce he draweth in his horne
Trulye he wisheth he had ne'er been borne.
For eke withal the Healthman shall survey
The countryside from whence he draweth paye,
And men in his employ must cart ye mucke
And garbage from men's houses in a trucke
Or else it shall be pilèd mountains high
And men will say it reacheth to the sky.
The precious fluid must be used for thatte
To ask aught else is talking through a hatte.
Behoves a man to put an utter bar
On milk or water carried from afar.
What can be left till later must he stoppe
Affairs of health perforce must show a droppe.

Letters to the Editor

NEONATAL COLD INJURY

SIR,—Dr. Mann and Dr. Elliott are to be congratulated upon their clear description (Feb. 2) of what they have elected to call "neonatal cold injury." The term has the advantage of pointing to the most important single ætiological factor—chilling—while embracing a clinical picture which to the minds of many extends from an apparently uncomplicated hypothermia to an irreversible sclerema.

I am glad that the authors mention that factors other than cold may help to precipitate the condition. In some full-term infants who show this picture it is difficult to accept exposure as the most important operative factor. I have seen two babies recently who illustrate this point.

A male infant of 6 lb. 1 oz. birth-weight was born spontaneously by the breech. His dissimilar twin died on the first day of life. The survivor was apparently well until the fifth day, when he was noted to feed poorly and to feel cold. He was red and had pitting œdema and a rectal temperature of 91°F. He was transferred to the premature room where his temperature rose to 97°F within twelve hours, and without further treatment his temperature became stable within normal limits in a few days.

The second patient, a boy of 6 lb. 10 oz. birth-weight, was an assisted frank breech birth. No abnormality was noted until the eighth day when he became lethargic, unwilling to feed, cold, and erythematous. His rectal temperature was found to be 91°F. Again recovery was rapid on his being transferred to the premature room.

Both infants were born in the Simpson Memorial Maternity Pavilion and became hypothermic in a nursery the temperature of which was maintained by thermostatic control at 70°F. All other infants in the nursery were maintaining normal temperatures on each occasion. The severest rigours to which they had been exposed amounted to brief periods of partial exposure during changing and weighing. These can hardly be compared to the conditions prevailing in a new and inadequately heated prefabricated house in a snowstorm. I have little doubt that the temperatures of these two infants would have fallen further had preventive action not been taken.

There would appear to be in some newborn infants a deficiency of heat regulation because of which hypothermia may occur even under good conditions. Obviously the cold injury will be more severe if the environmental temperature surrounding such babies is low or if the infant's condition is not quickly appreciated and rectified. There would appear to be some factor other than prematurity, infection, or cerebral birth injury responsible for this central derangement.

I have treated this condition by short-wave diathermy in a small series over the past two years with considerable success. The response of laboratory animals rendered moribund by chilling and of hypothermic, not sclerematous, infants has been dramatic. The treatment was devised primarily for the treatment of sclerema, but I have not as yet had the opportunity of using it in this condition. Although I appreciate the hazards of increasing the metabolic rate in the presence of asphyxia, it has appeared to me a logical form of treatment in some such cases. The coexistence of infection of the respiratory tract and elsewhere is common. The hypothermic infant is less capable of dealing with invading organisms than the normal baby. The growth of the bacterial invaders, however, is not greatly influenced by the fall in body-temperature. Changes in the subcutaneous fat of the thorax add to the respiratory embarrassment. The duration of survival of the 8 fatal cases in the series of 14 infants described by Mann and Elliott varied from 7 to 100 hours with an average of 40 hours. For these

reasons I favour radio-frequency rewarming and the simultaneous careful use of oxygen.

The technique which has been evolved by Miss Sheila Cameron, M.C.S.P., and myself is still experimental, and through-and-through heating by short-wave diathermy is not advocated for general use. Severe local burning may occur in the presence of wetness or if the coil is improperly spaced. I have no doubt that a safe technique is now possible, and a full description of it and of the results obtained will be published later.

Department of Child Life and Health, University of Edinburgh. JAMES W. FARQUHAR.

HYPERTENSION: PRESYMPTOMATIC DIAGNOSIS AND TREATMENT

SIR,—Many of us share Professor Sanjivi's interest in the early and uncomplicated phase of essential hypertension (Feb. 2), and are concerned to know at what stage in the evolution of the syndrome it is right to intervene with a potent hypotensive drug. The trouble with Dr. Sanjivi's contribution to this problem is that, by the evidence of his representative case, his patients are not hypertensive in the proper sense of having an established high diastolic pressure. They are "diastolic reactors"—people whose pressure may be found casually raised but can fall within normal limits in nice circumstances and during sleep. In any case, an emotional reactivity of the diastolic pressure is a phenomenon of hypertension at all stages.

In my sort of psychosomatic interviewing,[1] with the patient at rest on a comfortable couch and showing no manifest anxiety, the average diastolic swing has been 25 mm. Hg during the discussion of his life situation, and swings of 45 mm. are not uncommon. The casual reading gives no indication of the potential seriousness or otherwise of this liability, because it may lie anywhere along the range according to circumstance. In particular it is unreliable as a base-line for assessing the effect of treatment.

I do not believe that Dr. Sanjivi has done more than demonstrate the fall in pressure as recorded by a particular doctor when he has established a good therapeutic relationship with a diastolic reactor. That the pressure stays satisfactory when the reserpine is stopped is proof of this.

I do not take issue with the use of reserpine when the hypertensive condition is severe, but I am sure that the way Dr. Sanjivi proposes is unwise. Firstly, if relief from worrying is a rationale, it must be said that in psychiatric practice reserpine has not proved itself better than amylobarbitone sodium.[2] Secondly, it is not innocuous: Smirk and McQueen [3] report that half their hypertensive patients complained of mild symptoms such as lassitude and some disturbance of sleep by nightmares, and a tenth had significant depression. In general, the depression may demand psychiatric measures in 5–20% of cases, and suicide is not uncommon. In our state of ignorance about the prognosis for a patient with a casual diastolic reading of 105 mm. Hg, 115, or, for that matter, 125, in the absence of complications, I do not see that we shall help by introducing a definite hazard of depression or impulsive suicide.

Hypertension is probably not a disease until it begets complications, and I think that a man may be a diastolic reactor throughout life without running into any more circulatory trouble than a normotensive person. We cannot evaluate the "late results of early treatment" until we know the late results of being a youthful diastolic reactor in the absence of treatment. In the meantime, unlike Dr. Sanjivi, I believe we should regard diastolic reactivity as a benign process—or shall I say only a little less benign than life itself, which is rather apt to end in cardiovascular disease. It is compatible with a normal life-span and with normal activities. The patient needs to be protected from the anxieties of his doctor about the ultimate prognosis. A worried preoccupation with blood-pressure readings, the premature imposing of restrictions, and the giving of drugs are potent sources of disabling anxiety symptoms.

Except in the accelerated phase, headaches do not call for hypotensive measures. They should be treated on their merits as tension or conversion symptoms. Better than succumbing to the blandishments of the drug houses and writing a prescription is a little sympathetic listening to the social, occupational, and family troubles that may be responsible for hypertensive episodes and outbreaks of anxiety and depression. The hypertension is best kept in the background, watched with masterly inactivity (or "hands folded") for the approach of complications, whilst the patient is treated as a person who from time to time gets into emotional difficulties with people in his environment.

Cranbrook, Kent. JOHN HAMBLING.

SIR,—Dr. Sanjivi has discovered the fallacy of a name—"benign hypertension"; he rightly states that it often kills. We all know that. Malignant, benign, essential, renal hypertension are all variants of "hypertensive disease."

There is no need to rail against this terminology. It is not meant to lead anywhere, and cannot therefore mislead. Mr. Smith may be a woodworker, pernicious anæmia is a harmless disease, and my grandmother may develop athlete's foot—no need to wax indignant, we all know what is meant. Names and labels are useful; they are not substitutes for descriptions even where they sound descriptive.

Dr. Sanjivi having unmasked the devil that lurks behind "benign hypertension" should go one further and exorcise the gremlin that lives in his sphygmomanometer. Whenever this instrument records above 150 mm. systolic and 95 mm. diastolic this gremlin whispers "disease" into the doctor's ear, and leads doctor and patient into the pharmacological wilderness. Yet, nine times out of ten he is dealing with a harmless elevation of blood-pressure that is ephemeral, truly benign, and not "disease."

Sir, a misunderstood sphygmomanometer reading can be as misleading as a name taken at its face value. Do not let us be misled by this facile but fallible gadget into the large-scale study of treatment of mostly healthy people. Let us first find out who needs treatment! What we need is not eleven cases treated over 11 or even 21 months. We need ten times eleven cases, observed without meddlesome treatment over twice 11 years, with records not only of blood-pressures but of urinary, fundal, biochemical, radiological, and electrocardiographic findings, set against the subject's heredity, constitution, environment, and occupation. Out of that study might—or might not—come a simple sign that would indicate when "moderately elevated blood-pressure" is the precursor of "hypertensive disease."

We would then still have to find out whether hypertensive disease is as amenable to treatment as the ubiquitous patient with a "headache and a tired feeling at the end of the day" and a blood-pressure of 168/106.

In the absence so far of such a discriminating sign it is our first duty not to submit healthy people to "certain simple restrictions of activity [what activity, and why?] and diet." We must still investigate adequately those patients with increased blood-pressure, particularly if their symptoms are more specific than "headache and tiredness"; we must evaluate our findings, temper them with our judgment, treat the few, and spare the many.

London, W.1. G. SCHOENEWALD.

1. Hambling, H. J. *In* Modern Trends in Psychosomatic Medicine (edited by D. O'Neill). London, 1955; chap. 12.
2. Hare, E. H., Seager, C. P., Leitch, A. *Lancet*, 1956, i, 545.
3. Smirk, F. H., McQueen, E. G. *Ibid*, 1955, ii, 115.

INTERACTION OF DEPOLARISING AND NON-DEPOLARISING RELAXANTS

SIR,—We regret that circumstances delayed our reply to the interesting letter of Dr. Churchill-Davidson (Nov. 10). In this communication he took exception to the use of the term "unexpectedly increased sensitivity to *d*-tubocurarine" used in our previous letter.

In an attempt to prove that our findings should not have been classified as "unexpected" he cites observations on the changing response evoked by repeated doses of C10 in certain mammals [1] and by a single dose of the same compound in myasthenics.[2] These observations were not unknown to us and as a matter of fact were links in the chain of thought leading to the present understanding of the mode of action of depolarising muscle relaxants. These observations, however, do not make our findings obvious, and thereby unworthy of reporting, as is implied by Dr. Churchill-Davidson.

Whether an observation is expected or unexpected depends on previous experience and mental outlook. We do not wish to argue this point, but would like to emphasise that, from observations on the changing character of the block caused by depolarising drugs in certain mammals, the differences observed in the type of block caused by these agents in myasthenic individuals, and the fact that neuromuscular block produced by prolonged administration of these agents can occasionally be reversed in man by anticholinesterases, it does not necessarily follow that increased sensitivity to non-depolarising muscle relaxants should be encountered after prolonged administration of depolarising substances in all human subjects tested.

If Dr. Churchill-Davidson, or anybody else, had formulated the hypothesis that "prolonged administration of depolarising drugs makes the endplate more resistant to depolarisation," then indeed the findings of Dr. Brennan [3] and those of ourselves could not have been classified as "unexpected." Such a hypothesis, however, as far as we know, has never been suggested, and only after the findings of Thesleff,[4] Brennan,[3] and ourselves became available did we feel justified in advancing the above hypothesis.

Additional experimental evidence obtained with the sciatic-gastrocnemius preparation of dogs and cats [5] and further clinical observation in man confirmed our assumption that prolonged administration of depolarising relaxants (e.g., suxamethonium and decamethonium) produces gradually increasing resistance of the endplate to depolarisation. In man, this increasing resistance may first be manifested by the need to increase the dose of depolarising relaxant to maintain a myoneural block of unchanged intensity. At this stage, the block is presumably still a depolarisation block, because it is intensified by anticholinesterases. Increased sensitivity to non-depolarising relaxants, however, is already evident at this time. In certain human subjects, but by no means in all, the resistance of the endplate to depolarisation can increase further, and in these cases the original depolarisation block can change to a non-depolarisation block reversible by anticholinesterases.

The rate of change in the sensitivity of the endplate to depolarisation varies, not only with the species investigated, but also with individuals of the same species and different muscles of the same individual. It is fortunate that in most instances acetylcholine, the "physiological transmitter," is still capable of depolarising the endplate, and thereby restituting myoneural transmission, at times when suxamethonium or decamethonium are no longer capable of producing depolarisation.

While we have the pen in hand, we would like to take exception to the use of the term "dual" block. The word "dual," as commonly used, implies two different actions occurring simultaneously (e.g., the nicotinic and muscarinic effect of acetylcholine). It is now evident that the type of block previously classified as "dual" is caused by progressive changes in the properties of the endplate. These changes can occur with varying speeds in different species. In view of the gradual change in the properties of the endplate and the nature of the block, the term "biphasic" (originally suggested by Jenden et al.[6]) or "multiphasic" block would depict the events at the endplate more truly and would be less likely to lead to misunderstanding of the basic principle involved.

Portsmouth, England. R. J. HAMER HODGES.

Pittsburg, Pa., U.S.A. F. F. FOLDES.

1. Paton, W. D. M., Zaimis, E. *Pharmacol. Rev.* 1952, **4**, 219.
2. Churchill-Davidson, H. C., Richardson, A. T. *J. Physiol.* 1953, **122**, 252.
3. Brennan, H. J. *Brit. J. Anæsth.* 1956, **28**, 159.
4. Thesleff, S. *Nature, Lond.* 1955, **175**, 594.
5. Foldes, F. F., Wnuck, A. L., Hodges, R. J. H., deBeer, E. J. *J. Pharmacol.* (in the press).
6. Jenden, D. J., Kamilo, K., Taylor, B. D. *Ibid*, 1951, **103**, 348.

HOME CARE FOR SICK CHILDREN

SIR,—With reference to last week's article by Dr. Lightwood and his colleagues, I must correct a wrong impression created by the statement that in the home-nursing unit set up in Rotherham in 1948 with which I was associated, there is no direct connection with the hospital services. In fact great stress has always been laid on coöperation with the hospital services, and the home nurses used in the unit attend hospital for a brief refresher course before commencing work with the unit. This point is shown quite clearly in the filmstrip made by Camera Talks showing the work of the unit.

J. ADRIAN GILLET
Dagenham, Essex. Medical officer of health.

"DOCTOR"

SIR,—It was with interest and amusement that I read Dr. Graham's enlightening article (Feb. 2). It is only to be regretted that the article was written by an F.R.C.P. and not an F.R.C.S.—which would have perhaps added weight to the wise suggestion put forward.

As an overseas doctor of medicine and a qualified surgeon, I am really struck by the importance surgeons attach to the title Mister. This in itself may not be so important, and indeed may simply be classified as one of those "traditional" things that linger on and, in a way, add originality to the British way of life. But does it not become ridiculous when the infection spreads downwards through all the layers of medical personnel? A houseman insists on being called, or is called, Mister during his six months in the surgical wards; then he changes over to the medical firm and is addressed as Doctor, and perhaps does not very well know what to be called during his gynæcological training! (Likewise, the ward sister, on obtaining an administrative appointment, insists on being addressed as "Miss.")

These are amusing rather than fundamental anomalies. But what is more serious is the use of the term Doctor in a derogatory way. How often has a surgeon rebuked his houseman with that particularly stinging accent on the last word of: "I told you to hold that retractor, Doctor"! I know of at least one sister who addresses the surgeon as Doctor when she is cross with him, and as Sir or Mister when he is in favour with her.

As Dr. Graham says, the practice causes a good deal of confusion among the public, and who has not known the patient who has shyly asked us whether we should be called Doctor or Mister? Worse still, surgeons have known the inconvenience of being reduced to a doctor's level during travel abroad, where all medical men are called Doctor.

In the scale of medical degrees, strictly speaking only he who has obtained the M.D. degree of a university can be called "Doctor." But the general public tend to address all medical men as doctors, and the term can perfectly well be retained for this purpose, without harm to anybody. If one had to search for logic, it is all surgeons *and* physicians who have not obtained their M.D. who should be called Mister, leaving the Doctor privilege to those who have their doctorate.

Perhaps the best solution is to take the public as the final arbiter: for them a doctor is he who practises as a qualified and registered medical man, whether he is called upon to treat Johnny's measles, to repair mother's prolapse, or to remove grandpa's prostate.

Southall, Middlesex. C. SWAN.

SIR,—One finds nurses and other medical personnel refusing to address anyone with a doctor's degree as "Doctor," unless he has a medical qualification: this happens not only in speech, but also in writing, and

such people will not be corrected. The public's use of Doctor is as a vulgarism: they cannot be bothered to say general practitioner or medical attendant.

Addlestone, Surrey. F. HILTON.

THE PLIGHT OF HOSPITAL PHARMACY

SIR,—All that Sir Hugh Linstead says (Feb. 2) applies with equal force to physiotherapists, and indeed all of the so-called auxiliaries. It is surely time that a complete review was made of salaries and conditions of these grades, and a degree of reality introduced.

Sudbury, Suffolk. DAVID WHITE.

SEPSIS IN THE NEWBORN

SIR,—The purpose of the investigation reported in the article by one of us,[1] to which your annotation of Jan. 26 refers, was a very limited one: to find out if, in a maternity hospital, a relatively simple technique for the routine care of the skin of the newborn could safely be substituted, during the first week or two of life, for the traditional technique involving regular bathing. We found no increase in the incidence of various skin troubles (including staphylococcal lesions) among the babies cared for by the simpler method.

Your annotation was mainly devoted to making two suggestions for remedying the fact that the investigation was "not conclusive as far as sepsis is concerned," and we would welcome the opportunity to make a brief reply to these suggestions.

While it is undeniably true that, mathematically speaking, "an investigation lasting two years . . . would have been more conclusive" (always provided that the one observer had had the stamina to see it through), we do not think that any corresponding practical advantage will inevitably result from such a prolongation of an investigation of this kind. We certainly would not expect to encounter the acid test you so confidently predicted—"a flare-up . . . with widespread infection and severe lesions." During the period of the past ten years, for which we have accurate day-to-day records of the incidence of skin sepsis in the Princess Mary Maternity Hospital, there has been a good deal of unexplained fluctuation from time to time (no doubt partly attributable to unconscious differences between the standards of different observers): but there has been only one episode which might be described as a "flare-up." In May, 1951, when a change was made in the technique for the routine care of the cord, there was a rapid rise in the incidence of skin sepsis so that in June 35% of the babies in the hospital developed one or more pustules during their stay (fortunately there were no "severe lesions"). The situation was promptly brought under control again by a further change in the technique for the care of the cord. Past experience, therefore, would lead us to be wary of the apparently innocent change in technique which may lead to unfortunate and unforeseen consequences on a large scale. But it would not lead us to expect "at least one flare-up" every two years.

It is also undeniably true that, as compared with the follow-up period which we relied upon (the duration of the babies' stay in hospital), "a follow-up of four months might have revealed some sepsis later." But even if there is any causal connection between the sericus visceral or bony lesions which may appear later, and "the relatively small skin lesion appearing in the first week," which has healed rapidly, we would not have expected to find a different incidence of these later lesions in two groups of babies which had shown the same incidence of the initial skin lesions. Furthermore, it is one of the advantages of working in a provincial centre that one should be able to obtain an accurate idea of the true incidence of such serious lesions. With regard to staphylococcal osteitis, for instance, we know that during the past eight years only two babies under the age of 4 months, who had been born in the Princess Mary Maternity Hospital, have been admitted to the pædiatric wards in the region for treatment. This figure gives an idea of the meagre reward which we would expect to be gained by a four-month follow-up of all the babies discharged from the hospital during a period of two years.

In short, we would like to suggest that the planning of an investigation of this kind ought to be based upon the solid foundation of a knowledge of the natural history of the conditions which it is proposed to study, in the particular institution concerned (rather than upon generalisations which may be true of some institutions, but not of others): and that it may be wiser to budget for a result which is "not conclusive" (but which will tell one what one wants to know), rather than to strive after some arbitrary standard of conclusiveness, and risk finding oneself to be engaged in the laborious pursuit of a will-o'-the-wisp.

Princess Mary Maternity Hospital, Newcastle upon Tyne. LAETITIA BRUCE
GERALD NELIGAN.

1. Bruce, L. *J. Obstet. Gynæc. Brit. Emp.* 1956, **63**, 735.

THE Rh BLOOD-GROUPS

SIR,—I was pleased to read that Dr. Nicholas (Jan. 19) acknowledges that, irrespective of nomenclature, the use of "most likely genotypes" leads to paradoxes. The point is that the paradox was introduced into blood-group literature by the CDE protagonists, as can be seen by consulting the book of Race and Sanger. In my own writings I have always been scrupulous in distinguishing phenotypes from genotypes, and so have all other workers who thoroughly understand the subject, and who therefore avoid the CDE notations. I trust that Dr. Nicholas's letter means that he intends to persuade Dr. Race and other CDE protagonists to abandon the use of "most likely genotypes." This will be the first step in clearing up their confusion, and then there are some two dozen additional paradoxes for which CDE protagonists are responsible,[1] which await Dr. Nicholas's attention.

Your leading article of July 21 last year stated that the CDE notations have "given every satisfaction, being easy to remember and understand." This statement is based on a misconception, since when workers use the CDE notations it is *because* they *do not* understand the subject. Those who thoroughly understand Rh-Hr serology and genetics have no difficulty with the correct Rh-Hr nomenclature, because this merely translates facts they already know into symbols. Your editorial also states that "it seems unlikely that outside the United States pathologists and others will wish to change over from the Fisher-Race to the Wiener nomenclature—a change which would involve much effort." This statement is also incorrect, because almost all those who are now using the CDE notations are also using the co-called "shorthand" notations. What is entailed therefore is not to learn something new, but to discard something old which has been shown to be incorrect. All intelligent workers will welcome such a simplification.

In a recent article,[2] it is pointed out that the medico-legal expert is expected to master all intricacies of Rh-Hr serology and genetics. If such an expert uses the CDE notations, this demonstrates his lack of understanding of the subject, and may be used by a lawyer to challenge his qualifications. The argument that the use of these symbols is needed to simplify the matter for the judge and jury is fallacious, because the competent

1. Wiener, A. S.: The Rh-Hr Types; a Budget of Paradoxes. *J. forensic Med.* (South Africa), 1955, **2**, 224.
2. Wiener, A. S.: Blood Grouping Tests in Disputed Parentage. *Ibid*, 1956, **3**, 138,

worker never finds it necessary to distort or misrepresent facts in order to achieve simplification.

In conclusion, I should like to reiterate that the scientific aspect of the controversy regarding Rh terminology is terminated, since all the facts are now readily available. The only problem remaining is one of education.

Brooklyn, New York. A. S. WIENER.

TOWARDS PREVENTING SUICIDE

SIR,—The article by Dr. Parnell and Dr. Skottowe (Jan. 26) and your annotation thereon are valuable in drawing the attention both of the medical profession and the public to the gravity of the problem. I disagree, however, with one conclusion in your articles—that treatment should be admission to a mental hospital.

In 1954 of 50 cases of attempted suicide admitted to the general hospitals of this group only 3 required subsequent admission to a mental hospital. These figures were published with a suggested scheme of preventive action [1] to counteract some of this annual carnage.

With the overcrowding of mental hospitals, many more psychiatrists should be included on the staffs of general hospitals, without them of necessity being attached, as now, to mental hospitals. This is unlikely to come to pass as long as regional boards receive most of their advice on mental health policies from medical superintendents of mental hospitals, whose primary concern is naturally for the mental hospitals.

Provided adequate psychiatric facilities are available at the general hospital, very few potential suicides need admission to a mental hospital. The coöperation between the medical, anæsthetic, and psychiatric departments at this general hospital is such that three members of the resident medical staff and one clinical-assistant general practitioner administer electroconvulsion therapy and apply other psychiatric therapeutic techniques to in-patients and outpatients under the direction of a consultant psychiatrist, and a number of beds are available in the medical wards for psychiatric cases.

I agree that preventive social psychiatry holds the key, and it may well be that the public-health services will in the future examine all school-children psychologically, as they now do physically, and that adults may be similarly screened periodically.

East Glamorgan Hospital,
Church Village, near Pontypridd. T. S. DAVIES.

RADIOACTIVE VITAMIN B_{12} IN THE DIAGNOSIS OF NEUROLOGICAL DISORDERS

SIR,—In their interesting paper last week Dr. Berlyne and his colleagues rightly stress the value of absorption tests with radioactive B_{12} for distinguishing non-anæmic patients with subacute combined degeneration from patients with other cord and nerve lesions. It should, however, be emphasised that, valuable as these tests are, particularly in the treated patient, they give only indirect evidence of vitamin-B_{12} deficiency.

Neurological lesions due to vitamin-B_{12} deficiency may occur in "vegans" who are able to absorb vitamin B_{12} normally,[2] and patients without vitamin-B_{12} deficiency may be unable to absorb normal amounts of the vitamin.[3] For these reasons direct evidence of deficiency of vitamin B_{12} is desirable before making so important a diagnosis as subacute combined degeneration of the cord. In non-anæmic patients this can be obtained only by measuring the concentration of vitamin B_{12} in the serum. Patients with subacute combined degeneration of the cord have very low serum-vitamin-B_{12} concentrations, whereas patients with other neurological lesions have either normal or only slightly subnormal concentrations of vitamin B_{12} in the serum. [4]

Of the methods available for studying absorption of vitamin B_{12}, Dr. Berlyne and his colleagues selected the Schilling test as the most convenient. It should, however, be remembered that this method has two minor disadvantages. Firstly, its accuracy is entirely dependent on a patient's ability to collect the urine passed during a 24-hour period. This may be difficult, particularly in confused or incontinent patients or in elderly females. Secondly, the urinary excretion of radioactive vitamin B_{12} is considerably reduced in patients with renal disease,[5] so that the results of the Schilling test may be abnormal even though the intestinal absorption of vitamin B_{12} is normal.[6]

Department of Pathology (Hæmatology), Postgraduate Medical School of London. C. C. BOOTH
D. L. MOLLIN.

BIRTHDAYS OF SPASTICS

SIR,—Recently when reviewing spastics of school age, quite accidentally I noticed that their months of birth were not evenly distributed throughout the year. Of the 62 spastics reviewed only 10 were born in the four months December to March. The largest numbers were born in the period June to August (25). This difference hardly seems to be a matter of chance.

There seem to be two possible causes for this uneven distribution. Do spastics who are born in the cold months of the year tend to die at a very early age? In this respect the article by Dr. Mann and Dr. Elliott (Feb. 2) might be of interest, particularly as spastic children are known to be sensitive to changes of temperature. If in fact there are fewer actual births of spastics during the period December to March, one may have to think in terms of infections of the mother during pregnancy.

It would be interesting to know, from those who devote much of their time to the care of spastics, whether this observation is confirmed.

Public Health Department,
Glamorgan. R. T. BEVAN.

PNEUMOTHORAX IN TRACHEOTOMY

SIR,—I was interested in Dr. McMath's report [7] of pneumothorax complicating tracheotomy in a case of laryngo-tracheo-bronchitis. I was involved in the supervision of two cases of this nature; both patients died, and even at necropsy no tear in the parietal or visceral pleura could be seen.

CASE 1.—An infant, aged 11 months, who had been "croupy" for 5 days, became much worse despite treatment. Rib retraction increased, the pulse-rate rose to 160 per minute, and he was pale and becoming restless.

Accordingly tracheotomy was performed. The tracheotomy tube was finally inserted after a little difficulty, but thereafter his condition did not seem to improve. He was cyanosed and his ribs were still retracted. An hour later examination suggested left-sided pneumothorax. His left chest was needled at once, but he died.

Necropsy showed acute laryngo-tracheo-bronchitis with left-sided pneumothorax and massive collapse of the left lung; subcutaneous emphysema around the wound in the neck, and also a little in the mediastinum; no rupture of the pleura; and grossly enlarged thymus (32 g.) which microscopically was normal.

CASE 2.—An infant, aged $6\frac{1}{2}$ months, had been "croupy" for 24 hours. He had slight indrawing of the ribs, and did not improve with treatment in a steam-tent. The following morning his pulse-rate was 140 per minute; his colour was good, but he was obviously exhausted and his ribs were still moderately retracted. A tracheotomy was performed, but he collapsed about 15 minutes later, became cyanosed, and died.

Necropsy showed the anterior mediastinum ballooned with air, subcutaneous emphysema extending throughout the

1. Davies, T. S. *Brit. med. J.* 1955, ii, 1326.
2. Badenoch, J. *Proc. R. Soc. Med.* 1954, **47**, 426.
3. Baker, S. J., Mollin, D. L. *Rev. Hémat.* 1955, **10**, 181.
4. Mollin, D. L., Ross, G. I. M. *Proc. R. Soc. Med.* 1954, **47**, 428.
5. Brus, I., Mollin, D. L. Unpublished.
6. Schwartz, M. Personal communication.
7. McMath, W. F. T. *Lancet*, 1956, ii, 750.

mediastinum and along the abdominal aorta into the pelvis; and massive collapse of both lungs, which microscopically showed peribronchial cellular infiltration amounting to consolidation in some places.

In these two cases the respiratory disorder had been present for some days, and it may be in such cases that the danger of pneumothorax is greatest. Furthermore, a low tracheotomy was performed in both cases, and it is obviously easier for air to enter the cervical fascia and mediastinum with this low approach to the trachea.

After opening the neck with the tracheotomy incision the tube must be inserted quickly, as the inspiratory efforts are still great until the trachea is opened. Furthermore, the tube must be secured firmly, as if it slips out respiratory distress may begin and air be sucked in.[3]

Renmark, South Australia. J. G. WILSON.

A MISSED FRACTURE

SIR,—I would like to believe that Dr. Stone intended his letter (Feb. 2) to be taken as a piece of sarcasm. If this is indeed the teaching in our medical schools today there is every excuse for the diminishing esteem with which our profession appears to be regarded by the public. As Dr. Stone says, the public has a right to treatment, and that treatment should be the treatment of whole human beings—not of arms or legs or skulls or what you will. An adequately complete examination is not so time-consuming as Dr. Stone seems to think. Anything less deserves every stricture that is coming to it and can certainly be regarded as evidence of lack of proper professional care. No doubt we all of us fall short of the ideal on occasion. That should not prevent us from recognising and regretting a lapse in professional standards.

Marlborough College, Wilts. T. A. A. HUNTER.

SHORTAGE OF RADIOGRAPHERS

SIR,—As one of the older radiographic workers, I should like to comment on Dr. Illingworth's letter (Jan. 5).

Dr. Illingworth states that it is wrong to assume that the present shortage of radiographers is primarily due to inadequate remuneration, and that the dissatisfaction is largely confined to the few male radiographers.

In my own small circle I know of three young married male radiographers, all with children, who have found other work simply because they could not make ends meet on their salaries as senior workers. I also know of two others who have emigrated for the same reason. As regards new entrants to the profession, I know that prospective male students, and their parents, lose interest when informed of the salary-scale. Exception is taken not so much to the initial salary (although this is on a par with that of a hospital porter) as to the absence of career prospects.

Dr. Illingworth says that radiography is essentially a job for a girl. I wonder why "essentially"? Is it simply because a girl can afford to work for a smaller salary than a man? I can think of no other reason. Personally, I think a man is the better proposition in the long run—better because, provided that he earns enough to keep himself and his family in reasonable comfort, he usually stays in a job for life; whereas the majority of women forsake it for marriage.

It is true that the modern radiographer does not need to possess the electro-technical knowledge which was required by the radiographer of former days, but surely Dr. Illingworth will admit that knowledge of other kinds is required? I have been in X-ray work for over forty years, both as an engineer and as a radiographer, and I am still learning.

The other things which Dr. Illingworth mentions are mostly related to professional standards. Radiographers have had to fight for what little place they have in the sun, and it is surely unreasonable to expect them to reduce their professional standards because of a shortage of radiographers, especially since they themselves are in no way to blame for the shortage. Why should we open our doors to the illiterate—assuming, of course, that the illiterate could do our work? Radiographers are doing no more, no less, than other professional bodies do. All professional bodies, without exception, partly in the furtherance and the protection of their own interests, strive to maintain as high a standard as they possibly can. In a democratic society their right to do so is both recognised and upheld.

When Dr. Illingworth ridicules the idea of a pre-entry qualification in English, and thereby infers that it should be done away with, he is asking radiographers to cut their professional throats. The salaries of radiographers are determined by Whitley Council machinery, and this machinery is extremely sensitive to such things as pre-entry qualifications and length of training. Where would we stand if we reduced our standards? Surely it must be realised by all that prestige and status mean just as much to a radiographer as they do to any other professional person.

Swansea Hospital. DONALD R. GOULD.

AMIPHENAZOLE

SIR,—If Dr. Ballantine's findings with amiphenazole (Feb. 2) can be confirmed in a large series of cases, we will have a drug of great value in the treatment of intractable pain. In a series of ambulatory patients who have received oral amiphenazole and large doses of analgesics, some of the claims made by McKeogh and Shaw[1] have not been confirmed, especially as regards reduction of vomiting, constipation, and respiratory depression. However, I have, as yet, found no evidence of addiction in any of the patients, during periods of treatment lasting from 2 to 27 weeks.

The acid test of prevention of addiction would be the ability to reduce the dose of analgesics without withdrawal symptoms, but since pain was mostly due to malignant disease this was rarely possible.

Analgesics have been stopped entirely in 5 patients: in 2 instances because of lack of benefit where severe pain was only intermittent and was of short duration, and in 3 patients where relief was obtained by nerve section or alcohol block. Their daily dose of analgesics was as high as 54 mg. levorphanol or 250 mg. methadone with 120–300 mg. amiphenazole, and no side-effects were observed during the withdrawal period, which did not exceed one week. Levorphanol and methadone were the only analgesics which proved to be consistently effective by the oral route.

Vomiting, which is a major problem when large doses of potent analgesics are given by mouth, does not appear to have been reduced by amiphenazole. Its occurrence is unpredictable; some patients will tolerate enormous doses while others cannot retain even the smallest dose. Vomiting responds very well to cyclizine or chlorpromazine, but chlorpromazine intensifies the soporific effects of the analgesics.[2]

In view of the apparent prevention of addiction to analgesics by amiphenazole, the drug has been given to a few patients with severe post-herpetic neuralgia, and the results have been most gratifying.

One elderly patient, who attempted to commit suicide because of pain, was started on 18 mg. levorphanol with 100 mg. amiphenazole daily about six months ago. She voluntarily reduced this to 13·5 mg. levorphanol and 80 mg. amiphenazole during the first few weeks and has continued on the same régime since.

In view of the report by Dr. Ritchie Russell and his colleagues (Feb. 2) this treatment may be better reserved

3. Barrie, M. J. *Ibid*, 1940, i, 996.

1. McKeogh, J., Shaw, F. H. *Brit. med. J.* 1956, i, 142.
2. Shaw, F. H., Shulman, A. *Ibid*, 1955, i, 1367.

as a temporary measure, combined with intensive local therapy. Patients could be made more tolerant to active treatment, and the analgesics stopped when no longer needed.

Department of Anæsthesia, University of Liverpool. JOHN W. DUNDEE.

PRACTITIONER AND LOCAL AUTHORITY

SIR,—I do not wish to revive the lively correspondence under the title "Clinicosis," but your editorial (Feb. 2) warrants some comment.

In quoting from Ramage's paper on this subject you express the view that "general practitioners *could* become responsible for some local-authority services." In the sense of "competent to," I would agree, and, as a teacher, stress that it is not sufficiently realised that the medical student of today is taught much in the preventive field which the general practitioner alone can put into effective use.

However, you state, equally dogmatically, that "from the correspondence most doctors think they *should* do this work." What really are the motives for this? In discussing the "take-over" of clinic services you state:

"but it is unlikely to happen for a long time unless general practitioners are given some *financial reward* [italics are mine] for providing these extra services. As things now are, and as Ramage's inquiry illustrates, it is doubtful whether the present size of general practitioners' lists allows them time for anything but a gesture at preventive work."

Further comment is hardly necessary, except to say that many general practitioners do not realise that preventive work often takes more time than curative, although unlike the latter its effects are likely to be cumulative. One wonders whether the general public, who pay all the bills, would be convinced that at the moment the general practitioner has more time than he needs for his curative work. The prerequisite for the general practitioner doing real preventive work would be a reduction in his curative case-load.

Department of Preventive Medicine and Public Health, University of Leeds. C. W. DIXON.

UNMARRIED PARENTHOOD

SIR,—Dr. Comfort writes (Jan. 26): "the devotion of moral agencies to the prevention of coition has often eclipsed their anxiety over the tangible suffering unwise coition may cause."

As one who has had some experience of one of these "moral agencies"—the Church of England Moral Welfare Council—I am astonished at Dr. Comfort's allegation, since moral-welfare workers and councils are only too terribly aware that the amount of time and effort spent of necessity in connection with unmarried mothers and their urgent material problems leaves far too little time for the general educational work so essential amongst young people and which they feel should really be a first priority.

Dr. Comfort's suggestion, that "the obvious first step" to reduce the present tragic unhappiness of the unmarried mother is "general contraceptive education," would prove an encouragement to young people to indulge in premarital coition as an interesting experiment rather than, as happens at present, as an uncontrolled emotion—thereby debasing the act to a far lower level than that on which it usually takes place. Moreover, it may be doubted whether universal knowledge of methods of contraception *would* appreciably reduce the illegitimate birth-rate, since a high proportion of putative fathers and a not inconsiderable proportion of unmarried mothers are perfectly well aware of contraceptive methods; but, owing to carelessness, laziness, and lack of self-control and moral fibre, they urge or permit coition with little or no thought of the possible consequence.

It seems doubtful if the tragedy of unmarried motherhood can be lessened by any means other than education—not in contraceptive methods, but in the proper relationship and respect one sex should have for the other and in the encouragement of the ideal that coition should be the culmination of the expression of the love of two persons who have accepted each other as a partner for life.

Dr. Comfort's suggestion that "the attempted prevention of sexual behaviour in young people" is one of the aims of moral-welfare organisations is as ludicrous as it is untrue. "Sexual behaviour" is natural to both adults and young people. This is fully recognised by moral-welfare workers who encourage it to progress on the right lines: progress such as this does not lead to extramarital coitus, but the wider dissemination of contraceptive methods amongst unmarried persons suggested by Dr. Comfort would, as I have previously suggested, by no means prevent unmarried motherhood; it would, on the other hand, almost certainly lead to an unnatural experimentation in the act of coitus, which should from the moral, practical, and æsthetic point of view be reserved for the culminating act of courtship and marriage.

Goulceby, near Louth, Lincolnshire. E. C. CORDEAUX.

SYRINGE CARRIER

SIR,—Dr Stark Murray (Feb. 2) almost fully answers the criticism made by Dr. McDonald and Mr. Pirnie (Jan. 26) of the syringe carrier which I described in your issue of Jan. 12. He fails, however, to elaborate upon his statement that this syringe carrier is "unlikely to solve the problems of the anæsthetist."

Dr. McDonald does not appear to have understood fully how this box works.

The number of syringes and their variety are composed beforehand to suit the particular operating-list with which it is intended to deal. The box is then opened only long enough for one syringe to be extracted at a time. The box is then closed. The time taken to do this is less than that in which a surgeon removes a gown from a gown-drum. Would Dr. McDonald therefore suggest that this method of sterilising gowns should be abandoned? The time taken to extract a syringe is about a fifth of the time taken to fill the syringe, carry it to the patient, and inject its contents into a vein.

Dr. McDonald does not appear to appreciate that the anæsthetist, when handling sterile apparatus, wears cap and mask, and washes his hands. Unlike Dr. McDonald, I do not believe that there is any real risk of a dirty syringe being replaced in the box.

At the moment I am carrying out a series of tests to establish whether the air in one of these boxes remains sterile from start to finish of an operating-list.

London, S.W.3. L. H. LERMAN.

ERADICATION OF TUBERCULOSIS

SIR,—Dr. J. H. Hudson's letter (Jan. 12) stimulates me to reply to his point (*c*). He asserts that the director of a mass-radiography unit has a statutory duty to notify pulmonary tuberculosis on the basis of X-ray examination alone. May I say that such action, apart from the ethical considerations, would be clinically and administratively inadvisable, leading to false notifications and unnecessary anxiety to patients. Surely pulmonary tuberculosis should not be diagnosed but only suspected on an initial film. Infiltration and cavitation can be due to other causes besides the tubercle bacillus, and if notification is to be made prematurely without clinical assessment of the patient and bacteriological examination of his sputum, the medical officer of health's notification register will become unreliable.

The present-day chest service is established as a means of supplying accurate diagnosis and treatment of pulmonary disease. I consider it would be a retrograde step if doctors reading X-ray films were to start notifying cases as tuberculous. It would be reminiscent of the bad old days when tuberculosis was notified on the simple basis of a chronic cough.

Newcastle upon Tyne. H. R. THOMSON.

TETRAETHYL LEAD POISONING

SIR,—Tetraethyl lead poisoning due to cleaning tanks is a disease that may affect seamen. I can add to the four cases of Dr. Boyd and his colleagues (Jan. 26) that of a Polish sailor who was an inpatient in the Seamen's Hospital (under the care of Dr. Alec Wingfield) from October to December, 1956.

He had abdominal colicky pain, tightness in the chest, and vomiting. His scleræ were slightly icteric; he had a hæmolytic anæmia (hæmoglobin 8·2 g. per 100 ml., mean corpuscular fragility slightly decreased, reticulocytes 6%, active normoblastic marrow, serum-bilirubin 2 mg. per 100 ml.), and 0·8% of his red cells showed the coarse punctate basophilia of lead poisoning. Urinary lead excretion was 0·3 mg. in 24 hours. He said that the haze of rust in the atmosphere during scaling of the tank gave rise to cough with rusty sputum. It was interesting to compare this seaman with a case of straightforward lead poisoning in an accumulator worker who happened to be in hospital at the same time: this patient's complaint was also colicky abdominal pain (he had been thought to have a perforated peptic ulcer), but he had no anæmia and excreted no lead in the urine, though he showed characteristic coarse stippling of his red cells. Both patients responded very definitely to therapy with intravenous edathamil calcium disodium ('Versene').

Devonport Laboratory, Greenwich, London. G. L. ROBINSON.

THREE CASES OF DYSURIA

SIR,—Dysuria is a symptom met by all of us daily. The following three cases all presented with this complaint, and the final diagnosis was made only with some difficulty. The patients were all young males.

CASE 1.—A boy, aged 3 years, a thin miserable child who was always unwell, was said to have dysuria and abdominal pain. There was no previous history of urinary symptoms.

He had a tender abdomen and pyrexia, but, as he always cried when approached, it was hard to say how much pain he was having. His urine showed a cloud of albumin. I thought his pain was too severe to be due to urinary infection, and I requested his admission to hospital as a possible acute abdomen.

After admission, he was observed for 48 hours, and a precautionary laparotomy was then performed. At the operation, at which a normal appendix was removed, it was noticed that the left kidney and ureter were enlarged. Investigation showed a normal right kidney and a gross left hydronephrosis and mega-ureter, which proved to be due to chronic pyelonephritis. The kidney was removed, and the child is now very well indeed, cheerful and chubby, with rosy cheeks and a ready smile.

CASE 2.—A youth of 19 complained of dysuria. Examination of his urine showed a cloud of albumin. The abdomen was not tender and he was afebrile. A tentative diagnosis of cystitis was made and he was given sulphonamides and potassium citrate. Then began a series of bizarre symptoms, including jaundice which lasted 48 hours. His temperature was normal by day, but rose in the evening to 100 or 101°F. He was seen at home by a surgeon who advised admission.

On admission his temperature was 100°F, he was now tender in the left iliac fossa, and his left kidney was palpable. Next day jaundice reappeared and a physician thought that he had an obstructive infection of the kidney. Intravenous pyelography showed a space-occupying lesion of the lower pole of the left kidney. On examination of the kidney after its removal this was found to be a clear-cell carcinoma. A year later, he is very fit.

CASE 3.—Another boy, aged 17, who also complained of dysuria, was afebrile, and had no abdominal pain. His urine contained albumin. A tentative diagnosis of cystitis was made and he was treated with sulphonamides and potassium citrate. Next day he had diarrhœa and nausea. I wondered whether he had dysentery with superadded cystitis, or diarrhœa due to the treatment. The question was answered next morning when he said that he had passed blood in his urine. A sample sent to the laboratory was found to contain many tubercle bacilli. He is now being treated for renal tuberculosis.

Thus three of the major diseases of the kidney presented with the same symptom—dysuria. Then followed a number of red herrings which diverted attention from the kidney.

William Budd Health Centre, Knowle, Bristol. H. I. HOWARD.

TREATMENT OF POST-HERPETIC NEURALGIA

SIR,—The successful treatment of post-herpetic neuralgia by mechanical vibration, described by Dr. Ritchie Russell and his colleagues (Feb. 2), prompts me to report the following case of trigeminal neuralgia.

A man, aged 51, developed a right trigeminal neuralgia in 1950, following a bilateral Caldwell-Luc operation. An alcohol injection of the gasserian ganglion in 1952 produced only temporary and minor relief of pain. The pain became so intolerable that in July, 1954, the trigeminal nerve was divided in the posterior fossa. This produced immediate relief of pain, but unfortunately after the operation left hemiplegia with right facial palsy developed. Later the right cornea ulcerated and a tarsorraphy was necessary. The facial pain slowly returned, and though less severe, was still burning. He has not worked since the operation.

The patient was admitted here in October, 1956, at the request of a neurosurgeon, as an intractable rehabilitation problem. At that time he was socially independent and could walk short distances with the aid of one stick; he could not climb stairs or walk out of doors; dressing was difficult. He had a typical left hemiplegia with some shoulder control, although only flexion and abduction to 90°. There was virtually no control over the elbow, wrist, or hand. The left leg was spastic and weak, extended at hip and knee, and he had a dropped foot. He was emotionally unstable. On attempting any sustained effort he experienced paroxysmal pain which began in the right upper lip and spread rapidly over the whole right side of the face; it lasted 3–5 minutes, during which time he had to remain motionless, and it left an intolerable burning pain which lasted more than 30 minutes. This pain was only moderately controlled by pethidine 100 mg. three to six times per day, and was unaffected by sedatives or tranquillisers. The limit of his exercise tolerance was 20 yards slow walking. This made functional retraining or therapeutic exercise impossible

To help with his rehabilitation, procaine iontophoresis (2%, 4–5 milliamperes, 5 minutes daily), was given by a large electrode applied to the whole of the right face. For the following two hours it was possible to proceed with vigorous exercises without a return of pain, and during this period drugs were unnecessary. The iontophoresis was then given twice a day, and within a month he had made a good functional recovery from his hemiplegia. He was able to walk well, with only minor spasticity (his dropped foot was controlled by a below-knee calliper), and he had almost normal arm and hand function. However, his pain remained severe.

The patient was given a break for Christmas leave, and after a short remission the pain became so severe that he returned by ambulance, heavily sedated. He complained that the pain was worse than before nerve section and was no longer controlled by pethidine. The pain was brought on by any effort and by eating, and also occurred spontaneously. He was seen again by the neurosurgeon who could offer no help, other than the possibility of leucotomy.

Knowing of the success achieved with mechanical vibration in postherpetic pains by Ritchie Russell and his co-workers, this was tried with a hand-operated mechanical vibrator. The patient applied it himself for 5 minutes every hour to the trigger areas. Within 2 days he improved remarkably, and by 7 days the only trigger spot remaining was at the inner canthus of the eye, which was inaccessible to the head of the vibrator. This area has now responded to sustained digital (self-applied) pressure.

For the past 3 weeks the patient has been virtually symptom-free and can take exercise without pain. For the

first time in years he is taking pleasure in work and play. He has been provided with a mechanical vibrator to use at home.

This case well illustrates the point made by Ritchie Russell and his colleagues—that local anæsthesia by procaine iontophoresis and mechanical vibration may be valuable in the treatment of intractable pain.

Department of Physical Medicine and Rehabilitation, Devonshire Royal Hospital, Buxton. RONALD HARRIS.

PULLED ELBOW

SIR,—The clinical entity which Dr. Salkind (Jan. 26) describes is well known, and most of us have been taught to accept it as due to a subluxation of the head of the radius out of the annular ligament. This belief, I think, is based on a false assumption which is implicit in Dr. Salkind's account of the varying relationship in size of the radial head and neck. The assumption is that the annular ligament is around the *neck* of the radius, whereas in fact it is around the *head* of the radius. The annular ligament is attached in front to the anterior margin of the radial facet on the coronoid and behind to the posterior margin of the same facet. The stability of the radial head within the annular ligament cannot, therefore, be influenced in any way by the relative size of the radial head to the neck.

My views about Dr. Salkind's interpretation of this clinical condition are further reinforced by my own experience that these cases spontaneously settle down in a few days irrespective of any form of treatment, manipulative or otherwise.

County Hospital, Lincoln. DAVID F. THOMAS.

REPAIR OF FEMORAL HERNIA

SIR,—I had the good fortune to be taught McEvedy's approach to femoral hernia by a surgical registrar at my last hospital.

In Nigeria one has four or five hernias on an average operation-list; and many are femoral. Recently at the Civilian Hospital I saw two women with femoral hernias (in one case bilateral) about the size of a large grape-fruit. I used McEvedy's approach in both cases with utmost satisfaction. Perhaps the only drawback to this method is the tendency to puckering of skin when the vertical incision is used.

I was pleased to read the article by Dr. Mouzas and Dr. Diggory [1] and the letter from Mr. Reay-Young.[2] I also purchased a recent large textbook of operative surgery, but could find no description of, or even reference to, McEvedy's approach.

Military Hospital, Kaduna, West Africa. J. F. HICKEY.

NEURONE SELECTION IN RELIEF OF PAIN

SIR,—I should like to call attention to the work of Dr. Martonfy and Dr. Balta [3] in the neurological department of this hospital. We are using 10 ml. of an aqueous solution of phenol (0·5%) injected through the first or second sacral foramen in all forms of sciatica, in herpes zoster, and in cancerous intractable pain. The technique is that described by Bonica.[4]

The principal difference between our method and that of Dr. Maher (Jan. 5) is that by our method the phenol diffuses into the perineural tissue, whereas Dr. Maher injects it directly into the cerebrospinal fluid or the epidural-dural tissue. Our method has given very good results in 450 cases of sciatica and 54 of herpes zoster. As a rule a single injection sufficed to relieve pain and allowed the patient to move and walk with ease. The injection had often to be repeated in a day or two, but if as many as 3 injections were found insufficient the treatment was abandoned. About 15–20% of our patients proved to be refractory.

I have observed no disabling symptoms such as incontinence, and since the patients who were relieved have remained free from pain throughout the time of observation (one to two years) I have no hesitation in recommending this method for sciatica and herpes zoster.

St. Istvan Hospital, Budapest. T. LEHOCZKY.

1. Mouzas, G. L., Diggory, P. L. C. *Lancet*, 1956, ii, 1073.
2. Reay-Young, P. S. *Ibid*, p. 1217.
3. Martonfy, J., Balta, G. *Orvosi Hetilap*, 1956, **97**, 887.
4. Bonica, J. J. The Management of Pain. London, 1953; p. 352.

DANGEROUS CONTAMINANTS IN STORED BLOOD

SIR,—I too am greatly relieved that Dr. Discombe (Feb. 2) agrees that the use of blood that has been tapped (under approved conditions) may be safely used more than 24 hours after the tapping.

The scanty evidence available suggests that contaminants in blood in sufficient strength to be dangerous are exceedingly rare; and that they are in the bottle or cap before the blood is collected, as in Dr. McEntegart's cases,[1] and are not introduced by tapping the bottle under approved conditions. This somewhat dogmatic assertion is based on perhaps uncertain, but to my mind convincing, evidence, for in those regions where pilot tubes are not supplied very many bottles must have been tapped and used more than 24 hours after tapping: there is no record of blood contaminated in this way causing death.

Dr. Discombe asks how many patients I have saved from contaminated blood by the film technique: during the short time the technique has been in use no contaminated bottles have been found. If, however, antespective action had been taken, and the blood-film examined before rather than after the blood had been given, the two patients recorded by Dr. McEntegart might have survived. The same applies to other patients who have died from infected blood.[2 3] There are probably yet others, as not all deaths due to transfusion are recorded; and in some cases in which contaminated blood has been given the cause of death may have been missed.

If I had to prepare blood for a member of my family I would certainly examine a stained film. I would not worry if the bottle had been tapped previously by a trained worker in whom I had confidence and who had all facilities and if it had been properly refrigerated under continuous laboratory control. I would never use a bottle that had been handled by a careless clinician.

Pathology Department, Worthing Hospital. READ AIDIN.

AN AMERICAN IN BRITAIN

SIR,—It may be of interest to summarise my experience as an American Air Force physician during the past two years in Britain.

At our station, which has roughly 3000 troops and 500 dependants, we see many hundreds of "acute sore throats." In each case a throat-swab is cultured, and generally no antibiotic is given unless a Lancefield group-A organism is found. We have found such an organism in only 26 cases in two years. We have had no cases of rheumatic fever or of acute nephritis. Standard treatment is one shot of 'Bicillin' (benzathine penicillin).

At our well-baby clinic we see children roughly five times before the age of 3 years, and we try to apply a tuberculin skin test yearly. We have found 4 positive reactors in two years, and these children (aged 4 years or less) are all being treated with isoniazid. Progressive primary tuberculosis or other complication has not developed in any of them.

We have had no cases of chilblains or similar cutaneous disorder; but many have reported skin complaints

1. McEntegart, M. G. *Lancet*, 1956, ii, 909.
2. *Brit. med. J.* 1952, i, 1036.
3. *Ibid*, 1954, ii, 934.

(dryness, scaling, pruritus) apparently due to the local water, too little fat in the diet, and excessive washing with too strong a soap. It has been a great relief not to have to worry about dog-bites, because of the great rarity of rabies in the United Kingdom.

We have seen many cases of what is generally called either gastro-intestinal flu or epidemic nausea, vomiting, and diarrhœa (in children), and these cases have a certain similarity to the disease called winter vomiting sickness. Meningism, however, has not been prominent.

One interesting disorder is what we have come to call the "paraffin complex," which is due to misuse of paraffin heaters. Many of our people use these heaters in poorly ventilated rooms and may forget to trim the wicks. This produces headaches, injected conjunctivæ, and difficult breathing. Several children were treated for "recurrent pink eye" before the nature of the process was recognised.

Our problems with venereal diseases, adult tuberculosis, and catastrophic disease (diabetes, infarction, serious trauma) reflects, I believe, the expected incidence in an adult population of similar age composition in England.

From this brief survey it can be seen that, though our problems are pretty much the same, certain aspects are relatively fresh to us. In closing I should like to thank the local medical personnel for their unstinted help. It will indeed be a pleasure to entertain any that may visit us in the U.S.A.

R.A.F. Station,
Upper Heyford, Oxon. EMIL P. TAXAY.

Obituary

DOUGLAS ROBERT MacCALMAN

M.D. Glasg., F.R.C.P.E.

Dr. D. R. MacCalman had held chairs of psychiatry in Aberdeen and in Leeds. His death at the age of 53 has come at a time when his knowledge and experience, especially in child guidance, will be greatly missed.

He was the son of the late Rev. D. M. MacCalman of Strachur, Argyll, and he was educated at Glasgow Academy and at the University of Glasgow, where he was awarded the William Hunter medal in pathology. After graduating M.B. in 1929 he held resident appointments at Glasgow Royal Infirmary and at mental institutions. The following year he visited the United States and worked under Prof. Macfie Campbell at the Boston Psychopathic Hospital and under Prof. Adolph Meyer at the Johns Hopkins Hospital, Baltimore. At Boston he took part in a large investigation into the cause of schizophrenia and he also studied variations in the blood-picture in different psychological states.

On his return to this country in 1932 he became medical director of the Notre Dame child-guidance clinic in Glasgow. The following year he took the M.D. with high commendation, and in 1934 he joined the staff of the Royal Victoria Infirmary, Glasgow, as assistant physician for diseases of the nervous system. He continued the work on the Rorschach test which he had begun in the United States.

In 1935 he moved to London to take up the post of general secretary to the Child Guidance Council and psychiatrist to the Child Guidance Clinic.

At that time the Council was financed and in every other way upheld by the Commonwealth Fund, and MacCalman's knowledge of the way things worked in America was of great value. So also was his quiet determination to get child psychiatry on a sound footing in this country, and he drew general physicians, and particularly pædiatricians, as well as psychiatrists, academic psychologists, and the branches of the social services, into the work.

In 1938 he was appointed the first (and only) Crombie Ross lecturer in psychopathology in the University of Aberdeen. As a colleague later said: "That region of hardy Calvinists and high thinking must have been a difficult field for a psychiatrist to cultivate." But if his appointment was a bold experiment it was a successful one. His assignment was to give instruction in the causes and treatment of the common neuroses, and to develop a child-guidance service and inpatient and outpatient psychiatric services in the general teaching hospital. At the height of the Normandy campaign in 1944 many psychiatric casualties found their way to the E.M.S. hospital at Aberdeen, and MacCalman by early diagnosis and active treatment prevented the chronicity seen in the shell-shocked soldier. By 1946, despite war-time handicaps, he had vindicated himself as a pioneer, and the University of Aberdeen promoted his department to professorial status and installed him as its first professor of mental health. By the time he left in 1948 to take up his chair at Leeds the new department had been brought up to establishment, a comprehensive teaching programme organised, and the framework for an integrated mental health service constructed. W. M. M., his successor, records:

There is no feature of the present set-up in Aberdeen that Douglas MacCalman did not either plan or foresee. His effectiveness was all the more noteworthy because he was always so modest and unassuming. His West Highland canniness and reserve concealed an astute and lively mind, and his characteristic pawkiness many a time revealed itself in unexpected ways. But his most outstanding quality during the years that I knew him was his fortitude.

At Leeds he held at first the Nuffield chair of psychiatry; but in 1954, owing to ill health, he exchanged this for a part-time chair. Much of the organisation of the psychiatric services in the Leeds hospital region shows evidence of his interests. A flourishing child-guidance department in the university psychiatric clinic gave him scope for his experience. Last year he visited Australia as an adviser, and on his return to Leeds as part-time professor he supervised research projects which linked the university and the mental hospitals of the region. He also fostered the Leeds Regional Psychiatric Association and he was active in the formation of the Mental Health Research Fund.

E. M. C. writes:

MacCalman had a disarmingly quiet manner and a voice which was often difficult to hear. Anyone supposing that he was unable to stand up to opposing opinion would deeply misunderstand the strength of his character. Gentle he certainly was, but on occasion he could denounce sham and fumbling administration in terms of the keenest bitterness. It was, however, always done without rancour, and he always returned to the fight, tough and determined and deeply intuitive as to the needs of the situation, whether in terms of a personal patient or of the laying on of a service.

He died on Jan. 31. He leaves a widow and a daughter.

Appointments

BATES, MARGARET M., M.B. Camb., D.P.H.: M.O., public-health department, London County Council.

CORBETT, C. C., M.CH. N.U.I., D.L.O.: consultant E.N.T. surgeon, North West Durham and Durham group of hospitals.

DAVIDSON, J. T., L.R.C.P.E., D.A.: anæsthetist (S.H.M.O.), East Fife-shire, based on Kirkcaldy general hospitals.

DAWKINS, JOAN M. ST. V., M.B. Lond., D.P.H., D.C.H.: district M.O.H., Daventry.

LEVY, RONALD, M.B. Leeds, D.M.R.D.: consultant radiologist, Sunderland group of hospitals.

MALCOLMSON, K. G., M.B. Belf., F.R.C.S., D.L.O.: consultant E.N.T. surgeon, United Bristol Hospitals and the South-Western Regional Hospital Board.

MALE, R. S., M.B. Birm., M.R.C.P., D.C.H., D.P.H.: senior administrative M.O., Nottinghamshire.

NUTTEN, H. E., M.B. Aberd., D.P.H.: M.O.H., Beccles, Bungay, Halesworth, and Leiston.

PHILLIPS, J. L. J., M.B. Wales, D.O.M.S.: ophthalmologist, school health service, Stoke-on-Trent.

WINFIELD, F. I. B., M.B. Edin.: M.O., public-health department, London County Council.

Leeds Regional Hospital Board:

HOWARD, J. D., M.B. Sheff., F.F.A.R.C.S., D.A.: assistant anæsthetist (S.H.M.O.). Scarborough, Bridlington, Malton and Whitby group of hospitals.

PARKES, W. E., M.D. Belf., M.R.C.P., D.C.H.: consultant geriatrician, Huddersfield group of hospitals.

WARD, C. S., M.B. Lond., F.F.A.R.C.S., D.A.: part-time consultant anæsthetist, Huddersfield area hospitals.

Surrey County Council:

PRYCE-JONES, ELIZABETH, M.B. Leeds, D.C.H.: assistant M.O.

QUANTRILL, D. W., M.B. Birm., D.P.H., D.T.M. & H., D.OBST.: assistant M.O.

YATES, S. H., M.B. Sheff., D.P.H.: assistant M.O.

Notes and News

COMMITTEE ON RADIOLOGY

A COMMITTEE to review the present practice in diagnostic radiology and in the use of radiotherapy in non-malignant conditions has been set up by the Minister of Health and the Secretary of State for Scotland and has begun work. The decision to appoint this committee,[1] under the chairmanship of Lord Adrian, O.M., accorded with a recommendation by the Medical Research Council's Committee on the Hazards to Man from Nuclear and Allied Radiation.[2] The terms of reference of the new committee are :

" To review the present practice in diagnostic radiology and the use of radiotherapy in non-malignant conditions, having regard to the Report of the Committee on the Hazards to Man of Nuclear and Allied Radiations and to make recommendations."

The members in addition to the chairman are :

Prof. J. C. M'C. Browne, F.R.C.O.G. ; Sir Horace Evans, F.R.C.P. ; Mr. R. J. G. Grewcock, L.D.S. ; Prof. R. J. Kellar, F.R.C.O.G. ; Dr. Peter Kerley ; Dr. D. R. Maitland ; Prof. W. V. Mayneord, D.SC. ; Prof. J. S. Mitchell, F.F.R., F.R.S. ; Mr. C. Naunton Morgan, F.R.C.S. ; Dr. Kenneth Robson ; Mr. T. Holmes Sellors, F.R.C.S. ; Mr. G. R. Seward, M.D.S. ; Prof. F. W. Spiers, D.SC. ; Prof. E. J. Wayne, F.R.C.P. ; Prof. C. A. Wells, F.R.C.S. ; Prof. B. W. Windeyer, F.F.R.

A JOURNAL OF MEDICAL HISTORY

IT is a pleasure to welcome at long last a major British journal dealing with *Medical History*. Published by the antiquarian booksellers, William Dawson & Sons, and edited by Mr. W. J. Bishop, for many years librarian at the Wellcome Historical Medical Library, the first number of 90 pages is a handsome piece of work. Its decorative cover, incorporating a portrait of Thomas Linacre, worthily suggests the quality of the material it contains.

This quarterly journal devoted to the history and bibliography of medicine and the related sciences is already the official organ of three history-of-medicine societies and of the Osler Club of London. The five special articles in this number include an interesting account of Blue Books by Sir John Charles, and articles on the history of venous thrombosis, on the plague in Cambridge, and on the health of James VI of Scotland and I of England. There are also sections on texts and documents, and on news, notes, and queries, that may well be the strength of the journal. Book reviews, society reports, and a long list of medical anniversaries for 1957 are prominent features. There are eight admirable full-page plates. The paper and type are excellent.

There is at the moment a growing interest in medical history. The new journal will be an added stimulant and it deserves full support both financial and literary from all who are interested in medical history or medical bibliography. It is obtainable at £2 10*s.* per annum from the publishers, 4, Duke Street, Manchester Square, London, W.1.

S.H.M.O.s UNDERTAKING CONSULTANT DUTIES

COMMITTEE B of the Medical Whitley Council has agreed to consider claims for remuneration on the consultant scale submitted by senior hospital medical officers who are undertaking consultant duties.[3] Application forms may be had from the secretary of the British Medical Association (B.M.A. House, Tavistock Square, London, W.C.1), to whom the completed forms should be returned by March 2.

HOSPITALS IN NORTHERN IRELAND

THE report for 1955 [4] of the Northern Ireland Hospitals Authority shows that during the year admissions and outpatient attendances were each about 1% more numerous than in the previous year. The provision of new buildings at mental hospitals was helping to reduce over-crowding ; but, says the report, " further building will be essential before the situation can be regarded as satisfactory." Work continued on the planning of admission units for three mental hospitals.

International Society of Internal Medicine

Sir Russell Brain, F.R.C.P., has been elected president of this society. The next meeting will be held in Philadelphia from April 24 to 26, 1958.

1. See *Lancet*, 1956, ii. 150.
2. H.M. Stationery Office, 1956. See *Lancet*, 1956, i, 949.
3. *Brit. med. J.* Feb. 9, 1957, suppl. p. 60.
4. Issued by the Authority, Victory Buildings, 44, Queen Street, Belfast. Pp. 159. 3*s.* 6*d.*

University of London

Dr. M. J. Blunt, senior lecturer in anatomy at St. Bartholomew's Hospital Medical College, has been appointed to the readership in anatomy at that college.

Dr. Blunt, who qualified from Guy's Hospital in 1944, was resident surgical officer at Woolwich Memorial Hospital before he became lecturer in anatomy at the Royal Free Hospital Medical School. He has also been visiting lecturer in anatomy at Queen Elizabeth College. He took up his appointment at Barts last year. His published work includes papers on the poster or wall of the inguinal canal and on the blood-supply of the facial nerve.

Royal College of Physicians of Edinburgh

At a quarterly meeting of the college held on Feb. 5, with Dr. A. Rae Gilchrist, the vice-president, in the chair, the following were elected to the membership.

R. F. Gaymer, M. A. O'Halloran, Misra Madhav Prasad, James Allan, John Wilkinson, Boris Levin, Saifuddin Ahmed, Elaine H. McNeil-Smith, Mohan Sankar Naryan Pathy, Sharnagat Singh Khandpur, Ram Dev Pasi, B. J. Baldachin, J. R. Roy, A. C. Gibson, Purnendu Samaddar Mukherji, Flora M. Bisset-Smith, J. P. F. Fogarty, N. Z. Sacks, Tribhovanbhai Becharbhai Patel, Anokchand Jain, J. H. Learmonth, Koraiti Ardhanarishwara Krishnamurthy, Bhim Prosad Mozoomdar, W. B. Hudson, Pitambar Dayal.

Royal College of Physicians of Ireland

At a meeting of the college on Feb. 1 the following were admitted to membership : Elizabeth A. A. Awoliyi, W. D. Linehan, R. J. P. Skelly.

British Medical Association

The annual meeting of the association will be held in Newcastle upon Tyne from Wednesday, July 10, to Friday, July 19.

Biochemical Society

A meeting of this society will be held at the Senate House of the University of London, W.C.1, at 11 A.M. on Saturday, Feb. 23, when there will be a symposium on the structure and function of subcellular components.

Central Council for Health Education

The council's summer school is to be held from Aug. 20 to 30 at the University of North Wales, Bangor, on the promotion of health. The speakers will include Dr. J. N. Morris, Dr. Wilfred Barlow, and Dr. C. O. Carter. Further particulars can be had from the medical director of the council, Tavistock House, Tavistock Square, London, W.C.1.

Lady Tata Memorial Trust

The trustees of this fund invite applications for grants, scholarships, or fellowships for research on blood diseases, with special reference to leukæmia, in the academic year beginning next October. Programmes of research on any aspect of malignant disease which may throw light on problems of leukæmia will be considered, and awards may be made to investigators of any nationality, working in any country where payment can be made. Particulars and application forms may be had from the secretary of the (European) Scientific Advisory Committee of the trust, Chester Beatty Research Institute, Fulham Road, London, S.W.3. Applications must be submitted before March 31.

Society for General Microbiology

The general meeting of this society will be held at the Royal Institution, Albemarle Street, London, W.1, from April 15 to 17. At 6 P.M. on Monday, the 15th, Dr. André Lwoff, of the Pasteur Institute, Paris, will give the Marjory Stephenson lecture on the Notion of Virus. This lecture will be open to non-members. On Tuesday and Wednesday, the 16th and 17th, there will be a symposium on microbial ecology and the speakers will include Dr. Jane Gibson, Dr. E. S. Anderson, Dr. C. H. Andrewes, F.R.S., and Dr. G. S. Wilson. Further particulars may be had from the office of the society, c/o Institute of Biology, 41, Queen's Gate, S.W.7.

International Symposium on Curare and Curarising Substances

This symposium will be held in Brazil from Aug. 5 to 17. During the first week meetings will be held at the University of Brasil in Rio de Janeiro and during the second week visits will be made to Manaus (Instituto Nacional de Pesquisas de Amazonia) and to Belem (Instituto Agronomico do Norte). Further particulars may be had from Prof. C. Chagas, Instituto de Biofisica, Universidade do Brasil, 458, Avenida Pasteur, Rio de Janeiro, Prof. Daniel Bovet, Instituto Superiore di Sanità, 299, Viale Regina Elena, Rome, or Prof. P. B. Carneiro, Délégation du Brésil, UNESCO, 19, Avenue Kléber, Paris 16e.

International Symposium of Clinical Psychopharmacology

Further particulars of this symposium, which is to be held at Milan from May 9 to 11, may be had from Dr. S. Garattini, Via. A. del Sarto, 21, Milan.

European Organisation for Research on Fluorine and Dental Caries Research

A meeting of this organisation will be held at Malmö, Sweden, from June 15 to 17. Further particulars may be had from Professor Syrrist, Royal Dental School, Malmö.

Education for Motherhood

A seminar for medical officers of health on health education for the expectant mother is to be held at St. John House, Collingham Gardens, London, S.W.5, from Feb. 26 to March 1. Further particulars may be had from the medical director, Central Council for Health Education, Tavistock House, Tavistock Square, W.C.1.

Atoms and Health

The Royal Society of Health, with the United Kingdom Atomic Energy Authority, is holding an exhibition on this subject at 90, Buckingham Palace Road, London, S.W.1, from Monday, March 18 to Friday, May 31. It will be open to the public on Mondays to Fridays from 10 A.M. to 5 P.M.

Hearing-tests for Cerebral Palsied Children

A film on this subject has been made at the Centre for Spastic Children, Chelsea in coöperation with the audiology unit of the Royal National Throat, Nose, and Ear Hospital. The film is silent (16 mm., 650 ft.), and a script to go with it can be obtained or a lecturer supplied from the centre, 61, Cheyne Walk, London, S.W.3.

American Broadcasts on British Medicine

During February and March, in its weekly broadcasts on Thursday evenings *For Doctors Only*, the New York Academy of Medicine is including a series of lectures on British medicine. The lecturers are to be Sir David Campbell, Lord Cohen of Birkenhead, Sir Charles Dodds, Dr. J. R. Duthie, Prof. C. F. W. Illingworth, Prof. John McMichael, Prof. Alan Moncrieff, Sir James Paterson Ross, Mr. T. Holmes Sellors, Prof. B. W. Windeyer, and Prof. L. J. Witts.

Ministry of Health Appointments

Mr. Dennis Vosper, the Minister of Health, has appointed Mr. John Barter, M.P. for Ealing North, as his parliamentary private secretary. He has appointed Mr. P. Benner to be his private secretary and Mr. E. F. Cooper to be his assistant private secretary.

Mr. J. K. Vaughan-Morgan, the parliamentary secretary to the Ministry, has appointed Mr. J. P. Cashman to be his private secretary.

National Association for Maternal and Child Welfare

The annual conference of this association will be held at Church House, Westminster, London, S.W.1, from June 26 to 28. The theme of the conference is to be safeguarding the health of mother and child, and the speakers will include Dr. Charlotte Naish, Dr. J. W. B. Douglas, Dr. W. C. Cockburn, Dr. Ian Taylor, Sir Weldon Dalrymple-Champneys, and Prof. F. R. G. Heaf. Further information may be had from the secretary of the association, Tavistock House North, Tavistock Square, W.C.1.

International Poliomyelitis Conference

This conference will be held at Geneva from July 8 to 12. The subjects chosen for discussion include vaccination against poliomyelitis, enteric viruses producing disease simulating poliomyelitis, studies on cultured mammalian cells, general considerations of viruses, respiratory distress in patients with poliomyelitis, and care of patients severely stricken by poliomyelitis. Further information may be had from the secretariat of the conference, Hôtel du Rhône, Geneva, Switzerland.

French Government Exchange Scholarships

Under a reciprocal arrangement with the Centre National de la Recherche Scientifique, the Medical Research Council invite applications from British workers in medical science for two scholarships tenable at research institutions in France during 1957–58.

The scholarships will carry a maintenance allowance of 50,000–70,000 francs a month; married men will receive a supplementary allowance, and provision will be made for travelling expenses. Further particulars may be had from the secretary of the council, 38, Old Queen Street, London, S.W.1, with whom applications must be lodged by March 31.

Diary of the Week

FEB. 17 TO 23

Monday, 18th

HUNTERIAN SOCIETY
8.30 P.M. (Mansion House, E.C.4.) Mr. A. W. Badenoch: The Surgery that Hunter Changed.

UNIVERSITY COLLEGE OF LONDON, Gower Street, London, W.C.1
5.30 P.M. Mr. T. S. Work, D.SC.: Biochemical Approach to the Problems of Protein Syathesis. (First of two lectures.)

POSTGRADUATE MEDICAL SCHOOL OF LONDON, Ducane Road, W.12
4 P.M. Dr. W. Ritchie Russell: Pain.

Tuesday, 19th

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.2
3.45 P.M. Dr. Frank Stansfield: Anatomy of the Visual Pathway. (Arnott demonstration.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, London, W.1
8 P.M. *Pathology: Physical Medicine.* Dr. W. S. Tegner, Dr. Bruce Cruickshank, Dr. A. T. Richardson, Dr. L. E. Glynn: Rheumatoid Disease.

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1.) Mr. A. L. Greenbaum, PH.D.: Control of Fat Metabolism.

ST. MARY'S HOSPITAL MEDICAL SCHOOL, W.2
5 P.M. Mr. Norman Morris: Uterine Blood-flow During Late Pregnancy and Labour.

ROYAL ARMY MEDICAL COLLEGE, Millbank, London, S.W.1
5 P.M. Prof. G. W. A. Dick: Attenuated Virus Vaccines.

INSTITUTE OF DERMATOLOGY, Lisle Street, London, W.C.2
5.30 P.M. Dr. G. B. Dowling: Scleroderma and Dermatomyositis.

MANCHESTER MEDICAL SOCIETY
4.30 P.M. (Medical School, University of Manchester.) *History of Medicine.* Dr. William Brockbank: Debt of Medicine to Her Undergraduate Students.

Wednesday, 20th

ROYAL SOCIETY OF MEDICINE
8.15 P.M. *General Practice.* Dr. Kenneth Irvine, Sir Geoffrey Marshall, Sir Clement Price Thomas: Modern Outlook in the Management of Pulmonary Tuberculosis.

POSTGRADUATE MEDICAL SCHOOL OF LONDON
2 P.M. Dr. J. H. Humphrey: Biochemical Mechanisms Underlying Hypersensitivity Reactions. (First of two lectures.)

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. Henry Haber: Localised Disease of the Collagen.

INSTITUTE OF DISEASES OF THE CHEST, Brompton, S.W.3
5 P.M. Dr. Howard Nicholson: Pneumonia.

ROYAL MICROSCOPICAL SOCIETY, Tavistock House South, W.C.1
5.30 P.M. Mr. R. J. King, M.SC.: Investigations of Mouse Ascites Cells by Ultraviolet Phase-contrast and Interference Microscopy.

NOTTINGHAM MEDICO-CHIRURGICAL SOCIETY, 64, St. James's Street, Nottingham
8.30 P.M. Dr. R. M. B. MacKenna: Common Problems in Dermatology.

Thursday, 21st

ROYAL COLLEGE OF SURGEONS OF ENGLAND
3.45 P.M. Mr. B. E. Greenfield: Functions of the Masseter Muscle. (Arnott demonstration.)

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine.) Miss Honor Fell, F.R.S.: Physiology of Skeletal Tissue in Culture.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 26, Portland Place, W.1
7.30 P.M. Dr. W. S. S. Ladell: Physiological Aspects of the Heat Disorders.

HYPNOTHERAPY GROUP
8 P.M. (1, Wimpole Street, W.1.) Dr. D. M. L. Doran, Dr. Ian Hadfield: Hypnotherapy From the Trainee Point of View.

LIVERPOOL MEDICAL INSTITUTION, 114, Mount Pleasant, Liverpool, 3
8 P.M. *Pathological Meeting.* Dr. Edith Dawson: Mammary Cancer in Young Subjects with Special Reference to Pregnancy.

MANCHESTER MEDICAL SOCIETY
8 P.M. (Staff House, University of Manchester.) *Anæsthetics.* Dr. B. L. S. Murtagh: Anæsthetics and Midwifery.

NORTH WESTERN TUBERCULOSIS SOCIETY
5 P.M. (Manchester Royal Infirmary.) Dr. Brockbank: Asthma.

UNIVERSITY OF ST. ANDREWS, Queen's College, Small's Wynd, Dundee
5 P.M. Prof. C. Bruce Perry: Prevention of Acute Rheumatism.

Friday, 22nd

ROYAL SOCIETY OF MEDICINE
4 P.M. *Pædiatrics.* Dr. A. White Frankiin: Place of the Pædiatrician in the Maternity Hospital. Dr. John Murray, Dr. G. H. Lathe, Dr. A. P. Norman: Hæmolytic Disease of the Newborn.
8.15 P.M. *Obstetrics and Gynæcology.* Prof. J. McClure Browne, Mr. Norman Morris, Mr. John Sophian: Ætiology of Pre-eclampsia.

POSTGRADUATE MEDICAL SCHOOL OF LONDON
10 A.M. Mr. Geoffrey Flavell: Unusual Manifestations of Cancer of the Lung.

IN SEVERE HYPERTENSION

In dangerously high blood pressure oral therapy with 'Ansolysen', the long-acting pentolinium preparation, frequently permits a patient incapacitated by the disease to return to near-normal activity. At the same time organic damage may often be arrested and in some cases reversed.

In conjunction with the Rauwolfia alkaloid reserpine, used only where there is no history of mental depression, the hypotensive effect of pentolinium is in many cases maintained with greater smoothness.

PRESENTATIONS

'Ansolysen' *Tablets of 10, 40 and 200 mgm.*
0·5 per cent and 2·5 per cent solutions for injection.
1 per cent and 2·5 per cent solutions for injection, each with 0·5 per cent ephedrine hydrochloride.

Reserpine *Tablets of 0·25 mgm. and 0·5 mgm.*

MANUFACTURED BY
MAY & BAKER LTD

'ANSOLYSEN'

trade mark brand
PENTOLINIUM TARTRATE

An M&B brand Medical Product

MA3711

DISTRIBUTORS: PHARMACEUTICAL SPECIALITIES (MAY & BAKER) LTD · DAGENHAM · ESSEX

They like Lucozade..

and they can keep it down—

Lucozade has won its place in the sickroom because it is so very palatable. Patients enjoy it and, what is more, they can keep it down even when other food is refused, or vomited. It is difficult to assess the value of Lucozade simply in terms of the glucose it contains. It is the patient's response which is so interesting. Its acceptance so often coincides with a distinct and happy turn for the better, well illustrated in the following brief report:

"My little boy was ill . . . . and was completely off his food. I must admit that I only thought of Lucozade at the last moment, after two days of worry, but he improved from the time of taking it."
In a letter from Mrs. V. Darlington, Birkdale, Lancs.

LUCOZADE

the sparkling glucose drink

REPLACES LOST ENERGY

regda M37/0

Bavarian spas can help doctors to cure their patients

MANY of the health-resorts in Bavaria have been known for centuries past and are world-famous. Thousands of patients from all parts of the world recover their health in the fashionable climatic resorts, the spas and sanatoria in and arround the Bavarian Alps.

The greatest care is devoted to the patients' well-being. Local medical specialists work in close cooperation with their colleagues abroad for the benefit of their patients.

A detailed description of the 29 Bavarian health-resorts and spas will be sent on request.

TREATMENT OF:

Cardiac and vascular diseases • Muscular rheumatism • Rheumatism of the nerves and joints • Diseases of the respiratory organs • Diseases of women • Gastric, intestinal, hepatic and bilious complaints and metabolic disorders • Disorders of the hæmopoietic system • Neuralgia and neuritis • Endocrine disorders and those due to overstrain • Convalescence • ***Prospectuses available from the local spa Information Office (Kurverwaltung), and German Tourist Information Bureau, 6, Vigo Street, Regent Street, London, W.1.***

A copy (thirty-six pages, eighty-nine illustrations) of "Cures in Bavarian Health Resorts" is available on application to Bayerischer Heilbaederverband Nr. L/2, Bad Kissingen, West Germany.

Availability of Vitamins in Yeast

Deficiencies of single factors of the Vitamin B Group do not occur. Accordingly, even if a deficiency condition appears to result from the lack of an individual factor of the group and it is considered necessary to give intensive treatment with this factor, *the entire Vitamin B Complex should always be administered concurrently.*

It is, however, extremely important, in view of suggestions in recent publications, that the vehicle selected as a source of the entire B Complex does not withhold its vitamin content from the patient.

Human experiments show that the rich, natural vitamin potency of Aluzyme is totally available to the human system.

● *Aluzyme is not advertised to the public and may be prescribed on* form E.C.10.

ALUZYME
The NON-AUTOLYSED YEAST
with completely available Vitamins

Have you had your free copy of "The Therapeutic and Nutritional Value of Brewers' Yeast"?
Professional Samples and Prices on request from:—

ALUZYME PRODUCTS
PARK ROYAL ROAD, LONDON, N.W.10.

VALOXYLIN
Trade Mark

Whole liver extract reinforced with vitamin B12

For the treatment of pernicious anaemia with or without neurological manifestations and for those other types of macrocytic anaemia which also respond to liver therapy. For sprue and as a general tonic.

Literature and prices on request.

AN OXOID PRODUCT

OXOID

OXO LTD (Medical Dept.), 16, Southwark Bridge Road, London, S.E.1.
Tel.: WATerloo 4515

DROXALIN

A convenient form in which to administer Aluminium Hydroxide treatment

● **DROXALIN** enables Aluminium Hydroxide to be administered in an exceptionally palatable form.

● **DROXALIN** tablets are smooth, pleasant-tasting and break down easily in the mouth. They are, therefore, completely acceptable to the gastric patient. The tablets are individually and hygienically sealed in sets of six.

Professional samples available on request

ACTIVE INGREDIENTS
● *Aluminium Hydroxide*
● *Magnesium Trisilicate*

DROXALIN
Tablets
ACID ADSORBENT
Prescribed on Form E.C.10.

Manufactured by SCOTT & TURNER LIMITED
ANDREWS HOUSE, NEWCASTLE-ON-TYNE

NEW

evenly sustained 'round-the-clock' bronchodilatation

12 HOURS PROPHYLAXIS IN BRONCHIAL ASTHMA WITH A *SINGLE* DOSE

'asmapax'

ionex-tab

(Brit. Pat. Appln. No. 24974)

works 'round-the-clock'

controlled ionic exchange feeds ephedrine evenly and without interruption into the blood stream providing 10-12 hours freedom from bronchospasm.

FORMULA

EPHEDRINE RESINATE 100 mg. (equivalent to ¾ gr. Ephed. HCl.)
THEOPHYLLINE 65 mg., BROMVALETONE 150 mg., MEPHENESIN 50 mg.

AN ORIGINAL CPL RESEARCH PRODUCT

Average Basic N.H.S. cost of 12 hours prophylaxis—2d.

FOR CLINICAL SAMPLES, LITERATURE AND CASE REPORTS PLEASE WRITE TO

CLINICAL PRODUCTS LTD. RICHMOND SURREY

AMPHETONE

REGISTERED

A GENERAL STIMULANT FOR THE CENTRAL NERVOUS SYSTEM

For cases requiring a quick-acting general stimulant without increasing the patient's appetite, we consider Amphetone unique. It combines for the first time, Dexamphetamine Sulphate and Strychnine with Glycerophosphates and members of the Vitamin B Group. The Dexamphetamine provides the convalescent with an immediate feeling of well-being, this being followed by the well-known tonic effects of the other medicaments. Clinical reports have been excellent.

FORMULA

Dexamphetamine Sulphate B.P.C., 1/12 grain : Strychnine Hydrochloride B.P., 1/60 grain : Calcium Glycerophosphate B.P.C., 2 grains : Sodium Glycerophosphate B.P.C., 2 grains : Aneurine Hydrochloride B.P., 1/30 grain : Nicotinamide B.P., 1/4 grain : Riboflavin B.P., 1/60 grain : Syrup of Blackcurrant B.P.C., 2 fluid drms. : Water, to 1/2 fluid ounce.

[POISON] [S4]

Available in bottles containing 10, 20, 40 and 80 fluid ounces. Professional prices 4/8, 8/10, 14/7 and 26/6 each. Samples available on request.

JAMES WOOLLEY, SONS & CO. LTD., VICTORIA BRIDGE, MANCHESTER 3

In association with J. C. Arnfield & Sons, Ltd.
London Stockists : May, Roberts & Co., Ltd., 47, Stamford Hill Road, London, N.16.
Distributors for Northern Ireland : Messrs. Dobbin & Stewart, 47-49, Earl Street, Belfast.

for sterling quality —Scottish Widows' of course.

THE HALL MARK OF STERLING QUALITY IN MUTUAL LIFE ASSURANCE

SCOTTISH WIDOWS' FUND

Head Office:
9 St. Andrew Square, Edinburgh, 2
London Offices:
28, Cornhill, E.C.3 17 Waterloo Place, S.W.1

RHEUMATISM

AND KINDRED AILMENTS

Harrogate, the largest treatment centre in Great Britain, is actively engaged in providing all types of physical treatment in connection with the rheumatic diseases and and all types of physical rehabilitation. Extensive alterations have taken place, including the equipment of the establishment with DEEP POOL THERAPY, medical gymnastic facilities and occupational therapy.

HARROGATE

Treats both private patients under its All-inclusive Treatment Scheme, and National Health patients.

Medical enquiries as to cost, and how treatment can be obtained, will be welcomed by—

B. ROBERTS, Manager,
Section 2,

THE ROYAL BATHS
HARROGATE

Mas cura la dieta que la lanceta

A good diet cures more than the lancet.
(Spanish Proverb)

SINCE we all suffer at some time, many of us all the time, from such culinary curses of the age as harmful food processing—days-old vegetables—an emasculated loaf—*Supavite is good for everyone.* But over and above that basic truism you will know many categories among your patients for whom a food supplement of the calibre and comprehensiveness of Supavite is more than good—is maybe vital. Old people with inadequate shopping and cooking facilities, women in pregnancy and lactation, men undergoing heavy physical stress, convalescents, patients who have no appetite or must diet, ailing children—Supavite is their manna in the wilderness. Any clinical or sub-clinical state involving (or likely to lead to) mild vitamin deficiency is a cry for Supavite, which contains not only the essential vitamins but also the trace-elements necessary both in themselves and for proper utilization of the vitamins.

SUPAVITE
VITAMIN TRACE-ELEMENT CAPSULES

FORMULA

Each ORANGE *Capsule contains:*		*Each* BLACK *Capsule contains*	
Vitamin A	6,000 I.U.s	Vitamin B_1	2 mg.
Vitamin D	1,000 I.U.s	Copper (*Cupr. Sulph. ankyd. eq.*)	2 mg.
Vitamin C	25 mg.	Manganese (*Mang. Sulph. dried eq.*)	5 mg.
Riboflavine (B_2)	2 mg.	Iron (*Ferr. Sulph. Exsic. eq.*)	13 mg.
Nicotinamide	15 mg.	Iodine (*Calc. Iod. eq.*)	150 µg
Vitamin E (*d.l. alpha tocopheryl acetate equiv.*)	2 mg.		

THE ANGIER CHEMICAL CO. *Proprietors:* BRISTOL-MYERS CO. LTD., LONDON, S.E.1

Ampin

AUTOMATIC INJECTOR

Most routine injections are included in the 'Ampin' range and meet all official requirements for hospital or general practice

No wasted time
No syringe needed
No separate needle
No solution to prepare
Nothing to assemble - - - -
Nothing to sterilise - - - - - -

Cuxson, Gerrard & Co. Ltd. OLDBURY · BIRMINGHAM

OUABAÏNE ARNAUD

A most rapidly acting, non accumulating strophanthus glycoside.
Kept as International Standard in National Institute for Medical Research, London.

FORMS

TABLETS : 2.5 mg (1/24 gr.) Bottles of 40 and dispensing packs of 200
AMPOULES: 0.25 mg (1/240 gr.) For intravenous injection. (Boxes of 6)

Samples and literature on request. *Exempt from Purchase Tax.*

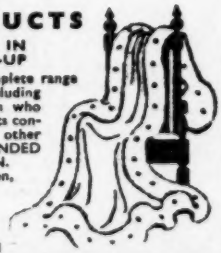
LABORATORY NATIVELLE Ltd.
74-77 White Lion Street, LONDON, N.1 18-19 Temple Bar, DUBLIN

QUEEN

Non Allergic
BEAUTY PRODUCTS
THE SAFETY FACTOR IN EVERY DAY MAKE-UP

Queen beauty products form a complete range of toilet and beauty preparations, including lipsticks, specially for those women who have sensitive skins. Queen products contain no orris in any form, nor any other skin irritants AND ARE RECOMMENDED BY THE MEDICAL PROFESSION. Obtainable from John Bell & Croyden, 50 Wigmore Street, W.1, and other chemists.

Write for Price List to:—
BOUTALLS CHEMISTS LTD.
60 Lamb's Conduit St., London, W.C.1



NORTHUMBERLAND HOUSE

Psychiatric Nursing Home
235-7 BALLARDS LANE, N.3 Tel. : FINchley 5283

Resident Med. Director Dr. R. M. RIGGALL,
Mem. Brit. Psycho-Analytical Socy.

Deep insulin coma unit, psychotherapy, etc. Fees from 12 gns.

CHISWICK HOUSE

PINNER, MIDDLESEX

Telephone : PINNER 234

Private Nursing Home for Mental and Nervous illness. All modern forms of treatment. Two country houses in adjoining grounds of 5 and 6 acres respectively, 12 miles from London. Trains every 15 minutes from Baker Street to Pinner.

DOUGLAS MACAULAY, M.D., D.P.M.

ST. ANDREW'S HOSPITAL FOR NERVOUS AND MENTAL DISORDERS

NORTHAMPTON

PRESIDENT: THE EARL SPENCER

MEDICAL SUPERINTENDENT: THOMAS TENNENT, M.D., F.R.C.P., D.P.H., D.P.M.

This Registered Hospital is situated in 130 acres of park and pleasure grounds. Voluntary patients, who are suffering from incipient mental disorders or who wish to prevent recurrent attacks of mental trouble; temporary patients, and certified patients of both sexes are received for treatment. Careful clinical, biochemical, bacteriological, and pathological examinations. Private rooms with special nurses, male or female, in the Hospital or in one of the numerous villas in the grounds of the various branches can be provided.

WANTAGE HOUSE

This is a Reception Hospital in detached grounds with a separate entrance, to which patients can be admitted. It is equipped with all the apparatus for the complete investigation and treatment of Mental and Nervous Disorders by the most modern methods; insulin treatment is available for suitable cases. It contains special departments for hydrotherapy by various methods, including Turkish and Russian baths, the prolonged immersion bath, Vichy Douche, Scotch Douche, Electrical baths, Plombières treatment, etc. There is an Operating Theatre, a Dental Surgery, an X-ray Room, an Ultraviolet Apparatus, and a Department for Diathermy and High-frequency treatment. It also contains Laboratories for biochemical, bacteriological, and pathological research. Psychotherapeutic treatment is employed when indicated.

MOULTON PARK

Two miles from the Main Hospital there are several branch establishments and villas situated in a park and farm of 650 acres. Milk, meat, fruit, and vegetables are supplied to the Hospital from the farm, gardens, and orchards of Moulton Park. Occupational therapy is a feature of this branch, and patients are given every facility for occupying themselves in farming, gardening, and fruit growing.

BRYN-Y-NEUADD HALL

The seaside house of St. Andrew's Hospital is beautifully situated in a park of 330 acres, at Llanfairfechan, amidst the finest scenery in North Wales. On the North-West side of the Estate a mile of sea coast forms the boundary. Patients may visit this branch for a short seaside change or for longer periods. The Hospital has its own private bathing house on the seashore. There is trout-fishing in the park.

At all the branches of the Hospital there are cricket grounds, football and hockey grounds, lawn tennis courts (grass and hard courts), croquet grounds, golf courses, and bowling greens. Ladies and gentlemen have their own gardens, and facilities are provided for handicrafts, such as carpentry, etc.

For terms and further particulars apply to the Medical Superintendent (TELEPHONE: Northampton 4354 (3 lines)), who can be seen in London by appointment.

CLIFFDEN, TEIGNMOUTH

For the early treatment of nervous disorders and patients needing rest and care

A well-appointed House with spacious balconies and extensive views of the South Devon Coast. Beautiful garden and own dairy in 35 acres In the same grounds, **ROWDENS**, a comfortable house with lovely views. Private road to the beach

There is also a charming house, **EBWORTHY, MANATON, DARTMOOR**, situated in 25 acres, 1100 ft. up for bracing moorland air

Resident Physicians—BERTHA M. MULES, M.D., B.S ANNE S. MULES, M.R.C.S., L.R.C.P. *Telephones*—TEIGNMOUTH 289 and 537

HEIGHAM HALL, NORWICH

PRIVATE MENTAL HOME for Nervous and Mental illness. All types of treatment carried out. Accommodation for Alcoholics and Addicts available. Special Geriatric Unit now open. Fees from 7 gns. per week upwards according to requirements.

Apply to Dr. J. A. SMALL Telephone: Norwich 20080

THE LANCET

Annual Subscription: £3 3 0 per annum

Special reduced rates to Medical Students and Doctors within 1 year of qualification.

THE MEDICAL PROTECTION SOCIETY LIMITED

Over 60 years experience in medical defence and protection

Complete indemnity granted to members in cases undertaken on their behalf

ANNUAL SUBSCRIPTION: £1 for first three years for newly qualified entrants and £2 thereafter

Full particulars from the Secretary (Dr. Alistair French), **Victory House, Leicester Sq., W.C.2.** Gerrard 4553 and 4814

Vacancies

ACADEMIC AND EDUCATIONAL SECTION *Page* 46

ANÆSTHETICS

Connaught, E.17. Sr. H.O. 48
New Cross, S.E.14. P.-t. Locum Reg. 48
Paddington Gen, W.9. Reg. .. 48
Barnsley. Beckett. Reg. 50
Crewe & Dist. Mem. Locum. 51
Leeds R.H.B. Locum Sr. H.M.O. .. 47
Manchester R.H.B. Locum Sr. H.M.O. 47
Manchester R.H.B. Sr. H.M.O. .. 47
Newcastle R.H.B. Regs. 54
Northampton Gen. Sr. H.O. & H.O. 54
North West Met. R.H.B. P.-t. Cons... 47
Nottingham Gen. Sr. H.O. 54
Plymouth. South Devon & East Cornwall. Sr. H.O.'s 54
Sidcup. Queen Mary's. Sr. H.O. .. 55
Southend-on-Sea. Gen. Sr. H.O. .. 55
Sunderland Area H.M.C. Sr. H.O. .. 56
Warrington Gen. Sr. H.O. 56
Windsor. King Edward VII. Reg. .. 56
Northern Ireland Hosps. Auth. Reg. 57

CASUALTY

Hampstead Gen., N.W.3. Sr. H.O... 48
Putney, S.W.15. Sr. H.O. & H.O. 48/49
Whipps Cross, E.11. Sr. H.O. .. 49
Aylesbury. Royal Bucks. Sr. H.O... 49
Bedford Gen. Locum Reg. 50
Chelmsford & Essex. Sr. H.O. .. 51
Coventry & Warwickshire. Jr. H.M.O. 51
Epsom Dist. Sr. H.O... 52
Hartlepools. Pre-reg. H.O. or Sr. H.O. 52
Hertford County. Sr. H.O. 52
Hounslow, Middx. Sr. H.O. 53
Kettering & Dist. Gen. Sr. H.O. .. 53
Northampton Gen. Sr. H.O. & H.O. 54
Reading & Dist. H.M.C. Sr. H.O. .. 55
Stockport Infy. Sr. H.O. 56
Swindon & Dist. H.M.C. Sr. H.O. .. 56
Weston-super-Mare Gen. Sr. H.O. .. 56

CHEST AND TUBERCULOSIS

Plaistow, E.13. H.O... 48
Birmingham R.H.B. Reg. 50
Glasgow. Stobhill Gen. Jr. H.M.O... 52
Harefield, Middx. Reg. 52
Henley-on-Thames. Peppard Chest. Jr. H.M.O. 52
Malvern. St. Wulstan's. Jr. H.M.O. 53
Scotland. Eastern R.H.B. Temp. Reg. 55
South West Durham H.M.C. Jr. H.M.O. 55
Watford Chest Clinic. Reg. 56
Worcester Park, Surrey. Mass Radiography Unit. Reg. 57

DERMATOLOGY

Northampton Gen. H.O. 54

EAR, NOSE, AND THROAT

Metropolitan E.N. & T., W.8. H.O.'s 48
St. James', S.W.12. Locum Reg. ... 49
St. James', S.W.12. Reg. 49
Whittington, N.19. Reg. 49
Ashton, Hyde & Glossop H.M.C. Sr. H.O. 49
Birmingham. Dudley Road. H.O. or Sr. H.O. 50
Birmingham R.H.B. Reg. 50
Canterbury. Kent & Canterbury. Sr. H.O. 51
Cardiff United Hosps. Sr. Reg. .. 51
Hartlepools. Sr. H.O. 52
Manchester. Wythenshawe. Sr. H.O. 54
South East Met. R.H.B. Reg. .. 56
Wigan & Leigh H.M.C. Reg... .. 57

GERIATRICS

Ashton, Hyde & Glossop H.M.C. Sr. H.O. 49
York A & Tadcaster H.M.C. Jr. H.M.O. 57

INFECTIOUS DISEASES
Eastern (Fevers), E.9. H.O. 48

MEDICINE
Finchley Chest Clinic, N.20. Reg. .. 48
Hampstead Gen., N.W.3. Pre-reg. H.O. 48
North Middlesex, N.18. H.O. 48
St. Stephen's, S.W.10. Reg. & H.O. 49
Aylesbury. Stoke Mandeville. H.O. .. 49
Bideford & Dist. Sr. H.O. 50
Birmingham R.H.B. Reg. 50
Cambridge. Addenbrooke's. H.O. .. 51
Chichester Group H.M.C. Jr. H.M.O. 51
Colchester H.M.C. H.O. 51
Derby. Derbyshire Royal Infy. Pre-reg. H.O. or Sr. H.O. 51
Enfield. Chase Farm. Sr. H.O. .. 52
Epping. St. Margaret's. H.O.'s .. 52
Ilford. King George. Pre-reg. H.O. .. 53
Newark Gen. Jr. H.M.O. 54
North West Met. R.H.B. Cons. .. 47
Nottingham City. Sr. H.O. 54
Portsmouth Group H.M.C. Pre-reg. H.O. 54
Reading Area Dept. of Medicine. H.O.'s 55
Rochford, Essex. Gen. Pre-reg. H.O. 55
Scotland. Western R.H.B. P.-t. Cons. 47
Taplow. Canadian Red Cross Mem. H.O. 56
Torquay. Torbay. Sr. H.O. 56
Tynemouth Victoria Jubilee Infy. Locum Jr. H.M.O. or Sr. H.O. .. 56
West Hartlepool. Gen. Sr. H.O. .. 56

NEUROLOGY
National Hosps. for Nervous Diseases. Reg. 48

NEUROSURGERY
Birmingham. Midland Centre for Neurosurgery. Sr. H.O. 50
Leeds United Hosps. Sr. Reg. .. 53
Romford. Oldchurch. Sr. H.O. .. 55

OBSTETRICS AND GYNÆCOLOGY
Plaistow Maternity, E.13. H.O. .. 48
Westminster, S.W.1, & Kingston, Surrey. Sr. Reg. 49
Birmingham United Hosps. Reg. .. 50
Bury & Rossendale H.M.C. Pre-reg. H.O. 50
Derby. Derbyshire Hosp. for Women. Pre-reg. H.O.'s or Sr. H.O.'s .. 51
Edgware Gen. H.O.'s. 52
Greenford. Perivale Maternity. H.O. 52
Hastings. Buchanan. H.O. 52
Leeds R.H.B. Reg. 53
Louth. County Infy. Sr. H.O. .. 53
Manchester. Crumpsall. H.O. .. 53
Newcastle R.H.B. Regs. 54
Plymouth. South Devon & East Cornwall Gen. Hosp. Group. Reg. 54
Rochford, Essex. Gen. Sr. H.O. .. 55
Rochford, Essex. Gen. H.O. .. 55
Scotland. Eastern R.H.B. Regs. .. 55
York. Maternity & Fulford Hosps. Sr. H.O. 57

OPHTHALMOLOGY
Hampstead, N.W.3. P.-t. Clin. Asst. 48
Royal Eye, S.E.1. Sr. H.O. 49
St. James'. S.W.12. P.-t. Reg. .. 49
West End Hosp. for Neurology & Neurosurgery, W.1. P.-t. Clin. Asst. 49
Birmingham R.H.B. Reg. 50
Brighton. Sussex Eye. H.O. .. 50
Windsor. King Edward VII. P.-t. Clin. Asst. 56

ORTHOPÆDICS
Royal National Orthopædic, W.1. Sr. Reg. 49
Beverley. Westwood. H.O. 50
Bristol. Winford Orthopædic. Sr. H.O. 50
Chertsey. St. Peter's. Sr. H.O. or Pre-reg. H.O. 51
Colchester H.M.C. H.O. 51
Galashiels. Peel. Sr. H.O.'s (Trainees) 52
Guildford. Royal Surrey County. H.O. 52
Leeds R.H.B. Locum Sr. H.M.O. .. 47
Leeds R.H.B. Reg. 53
Manchester R.H.B. Sr. H.M.O. .. 47
Manchester. Withington. Sr. H.O. .. 53
Margate. Royal Sea Bathing Sr. H.O. 54
Newcastle R.H.B. Reg. 54
Northampton Gen. H.O. 54
Worcester Royal Infy. H.O. 57

PÆDIATRICS
Queen Elizabeth Hosp. for Child. M.C. H.O. 48
Whipps Cross, E.11. H.O. 49
Aberdeen Special Hosps. B.O.M. Reg. 50
Barrow-in-Furness. Devonshire Road. Sr. H.O. 50
Chelmsford. St. John's. H.O. .. 51
Edgware Gen. Reg. 52
Manchester. Booth Hall Child's. Jr. H.M.O. 53
Manchester. Royal Manchester Child's. Reg. 53
Norwich. Jenny Lind Hosp. for Child. Locum Reg. 54
Reading. Royal Berks. H.O. 55
Sheffield United Hosps. Reg. 55
Southampton Child's. H.O. 55
Stoke-on-Trent. City Gen. Pre-reg. H.O. 56
Swindon & Dist. H.M.C. Sr. H.O. .. 56
York. County, City & Yearsley Bridge Hosps. Locum Sr. H.O. 57

PATHOLOGY
Dulwich, S.E.22. Sr. H.O. 48
Elizabeth Garrett Anderson, N.W.1. Sr. H.O. 48
Queen Charlotte's & Chelsea Hosps. Reg. 48
South West Met. R.H.B. P.-t. Cons. 47
Beverley. Westwood. Sr. H.O. .. 50
Bristol. Southmead Gen. Hosp. Group M.C. Sr. H.O. 50
Manchester R.H.B. Sr. H.M.O. .. 47
Manchester. West Manchester H.M.C. Sr. H.O. 53
Northampton Gen. Sr. H.O. .. 54
Oxford R.H.B. Cons. 47
Pontypridd. East Glamorgan. Sr. H.O. 54
Southampton Group Hosps. Reg. .. 55
South West Met. R.H.B. Cons. .. 48
Woking & Chertsey Group H.M.C. Reg. 57

PLASTIC SURGERY
Cambridge United Hosps. P.-t. Clin. Asst. 51
Newcastle R.H.B. Reg. 54

PSYCHIATRY
North Middlesex, N.18. Sr. H.O. .. 48
St. Mary's, W.2. P.-t. Reg. 49
Bedford. Bromham. Jr. H.M.O. .. 50
Birmingham R.H.B. Reg. 50
Carlisle. Garlands. Jr. H.M.O. .. 51
Colchester. Severalls. Jr. H.M.O. .. 51
Edinburgh. Royal Edinburgh Hosp. for Mental & Nervous Disorders B.O.M. H.O. 52
Hornchurch. St. George's. Temp. Reg. 53
Lancaster Moor. Locum Sr. H.M.O. 47
Lancaster Moor. Sr. H.O. 53
Leeds R.H.B. Locum Sr. H.M.O. .. 47
Macclesfield. Parkside H.M.C. Reg. 53
Manchester. Prestwich (Mental). Jr. H.M.O. or Sr. H.O. 53
Newcastle R.H.B. Reg. 54
Sheffield R.H.B. Cons. & Sr. H.M.O. 47
St. Albans. Napsbury Mental. Sr. H.O. 56
Stockport & Buxton H.M.C. Jr. H.M.O. 56
Virginia Water, Surrey. Holloway San. Locum Reg. 56
Wakefield. Stanley Royd. Jr. H.M.O. 56
West Cornwall Clinical Area. Cons. 47
York. The Retreat. Locum Reg. or Sr. Reg. 57
New York. Albany. Residencies .. 57

RADIOLOGY
Ashford, Middx. Sr. Reg. 49
Chichester Group. Locum Cons. or Sr. H.M.O. 47
Glasgow Royal Infy. Sr. H.O. .. 52
Manchester. North Manchester H.M.C. Locum Sr. H.M.O. .. 47
Scotland. Western R.H.B. Locum Sr. Radiologist 47
B.W.I. University College Hosp. Radiologist 48
New Zealand. Palmerston North Hosp. Board. Asst. Radiologist .. 47

RADIOTHERAPY
Manchester R.H.B. Reg. 53

SURGERY
Dreadnought Seamen's, S.E.10. Pre-reg. H.O.'s 48
German, E.8. Pre-reg. H.O. 48
Hampstead Gen., N.W.3. Pre-reg. H.O. 48
North Middlesex, N.18. Locum Reg. 48
Putney, S.W.15. H.O. 49
South East Met. R.H.B. Reg. .. 49
South Western, S.W.9. Pre-reg. H.O. 49
St. Giles', S.E.5. H.O. 49
Whipps Cross, E.11. Pre-reg. H.O. .. 49
Ashford, Middx. H.O. 49
Barnsley. Beckett. Reg. 50
Barnstaple. North Devon Infy. Pre-reg. H.O. 49
Behington. Clatterbridge. Pre-reg. H.O.'s 50
Bedford Gen. H.O. 50
Birmingham Accident. H.O.'s .. 50
Birmingham R.H.B. Reg. 50
Bishop Auckland. Gen. H.O. .. 50
Bishop's Stortford. Herts & Essex Gen. Temp. Reg. 50
Bournemouth. Christchurch. H.O. .. 49
Brighton. Royal Sussex County. H.O. 50
Canterbury. Kent & Canterbury. H.O. 51
Cardiff. Caerphilly & Dist. Miners'. H.O.'s 51
Carshalton. St Helier. H.O. .. 51
Cheltenham Gen. H.O. 51
Chertsey. St. Peter's. Sr. H.O. or Pre-reg. H.O. 51
Chichester Group H.M.C. Locum Sr. Reg. 51
Colchester H.M.C. H.O. 51
Croydon. Mayday. Locum Reg. .. 51
Darlington Mem. Sr. H.O. 51
Derby. Derbyshire Royal Infy. Sr. H.O. 51
Douglas. Noble's Isle of Man. H.O. .. 51
Driffield. East Riding Gen. H.O. .. 52
Durham. Dryburn. H.O. 52
Edgware Gen. H.O.'s. 52
Enfield. Chase Farm. Pre-reg. H.O. .. 52
Harefield, Middx. Pre-reg. H.O. .. 52
Hastings. Royal East Sussex. Pre-reg. H.O. 52
Hove Gen. Pre-reg. H.O. 53
Huddersfield Royal Infy. H.O. .. 52
Hull. Victoria Hosp. for Sick Child. Pre-reg. H.O. 52
Kirkcaldy Gen. H.O.'s 53
Leeds R.H.B. Reg. 53
Liverpool United Hosps. Temp. Sr. Reg. 53
Maidstone. West Kent Gen. Pre-reg. H.O. 53
Manchester R.H.B. Reg. 53
Margate Gen. Sr. H.O. 54
Newcastle Gen. Sr. H.O. 54
Newcastle R.H.B. Locum Cons. or Sr. H.M.O. 47
Newcastle R.H.B. Regs. 54
Northampton Gen. H.O. 54
Peterborough. Mem. H.O. 55
Pontypridd. East Glamorgan. Sr. H.O. 54
Portsmouth Group H.M.C. Pre-reg. H.O.'s 54
Port Talbot Gen. Sr. H.O. 54
Romford. Oldchurch. H.O. 55
Romford. Victoria. H.O. 55
Scotland. Eastern R.H.B. Reg. .. 55
Southampton. Royal South Hants. H.O. 55
Stoke-on-Trent. City Gen. Pre-reg. H.O. 56
Stoke-on-Trent. North Staffs Royal Infy. Pre-reg. H.O. 56
Swansea. Sr. H.O. 56
Tredegar, Mon. Gen. H.O. 56
Winchester. Royal Hants County. H.O. 56
Wolverhampton Royal. Pre-reg. H.O. 57
Worcester. Royal Infy. Locum Reg. 57
Wrexham. Maelor Gen. Pre-reg. H.O. 57

THORACIC SURGERY
Liverpool. Aintree. Sr. H.O. .. 53
Nottingham City. Sr. H.O. 54
Scotland. Eastern R.H.B. Sr. Reg. 55
Scotland. South-Eastern R.H.B. Reg. 55
Warwick. King Edward VII Mem. Chest. Jr. H.M.O. 56

UROLOGY
Bristol. Southmead Gen. Sr. H.O. .. 51

VENEROLOGY
St. Thomas's, S.E.1. Temp. P.-t. Jr. H.M.O. 49

GENERAL
U.S.A. Elmhurst Gen., N.Y. Internships & Residencies 57
U.S.A. Iowa Methodist Hosp. Interns 57

PUBLIC APPOINTMENTS 57
GENERAL PRACTICE 58
MISCELLANEOUS 58

The Terms and Conditions of Service of Hospital Medical and Dental Staff apply to all N.H.S. hospital posts we advertise, unless otherwise stated. Canvassing disqualifies, but candidates may normally visit the hospital by appointment.

Academic and Educational

THE UNIVERSITY
and the
ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

POSTGRADUATE MEDICAL EDUCATION COMMITTEE

REFRESHER COURSE FOR GENERAL PRACTITIONERS

A Refresher Course of 1 fortnight's duration designed for General Practitioners will be held from 13TH MAY to 25TH MAY, 1957. The greater part of the Course will comprise clinical demonstrations, ward visits, and lectures in General Medicine, General Surgery, and Obstetrics, but sessions on Infectious Diseases, Child Health, Ophthalmology, Dermatology, and Rehabilitation will also be included.

The fee for practitioners not claiming expenses from Government sources is 10 guineas.

Since the number admitted to the Course is limited, early application should be made to the Director of Postgraduate Medical Education, The University, Glasgow, W.2, from whom the syllabus and further information may be obtained.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

PROPHIT RESEARCH STUDENTSHIPS

2 candidates will be nominated by the Council of the Royal College of Surgeons of England in APRIL next for Prophit Studentships in Cancer Research.

The value of the Studentships will be £800 p.a., with an allowance not exceeding £200 for expenses and will be for 1 year from 1ST MAY, 1957, in the first instance, but renewable annually up to 5 years at the discretion of the Special Trustees on the nomination of the Council of the College.

At the Royal College of Surgeons there are specific openings for suitable candidates, to work :—

(1) in the Department of Anatomy on the problems of cell growth, particularly from the electron microscopic and quantitative aspects,

(2) in the Department of Pathology on general cancer problems.

Applications, accompanied by a recommendation from a member of the staff of the applicant's Medical School or University, should be sent to the Secretary, Royal College of Surgeons, Lincoln's Inn-fields, W.C.2, before 15th March, 1957. KENNEDY CASSELS, Secretary.

UNIVERSITY OF OXFORD

ELECTION OF 2 MEMBERS OF THE BOARD OF THE FACULTY OF MEDICINE BY THE GENERAL MEDICAL ELECTORATE

An Election of 2 Members of the Board of the Faculty of Medicine (*vice* Sir Arthur Porritt and Mr. J. H. Peel who are re-eligible) will be held on WEDNESDAY, 5TH JUNE, 1957. The members elected will hold office for 2 years from the first day of Michaelmas Term, 1957.

The General Medical Electorate consists of all Oxford Graduates in Medicine who are members of Convocation.

The Board of the Faculty of Medicine includes 2 members elected by the General Medical Electorate who must be members of that body and of whom 1 at least must be a person engaged in teaching 1 or more of the clinical subjects of the Faculty.

Nominations of duly qualified candidates for election will be received by the Secretary of Faculties at the University Registry up to 10 A.M. on Wednesday, 8th May, 1957. Each nomination must be signed by 6 members of the General Medical Electorate, and no candidate will be eligible whose nomination has not been received by that date.

UNIVERSITY OF LONDON

GRANTS FOR RESEARCH

Applications are invited from members * of the University and teachers in Schools of the University for grants from the Central Research Fund to assist specific projects of research and for the provision of special materials and apparatus. Grants are not made for normal maintenance.

Applications must next be received not later than 31st March. Forms of application and further particulars may be obtained from the Secretary to the Central Research Funds Committee, University of London, Senate House, London, W.C.1.

* Members of the University are defined by Statute as the Chancellor, the members for the time being of the Court and of the Senate respectively, the Professors and Readers and other Teachers of the University during their tenure of office, the graduates and the students.

UNIVERSITY OF BRISTOL

A REFRESHER COURSE for General Practitioners in OBSTETRICS AND GYNÆCOLOGY will be held from 1ST to 6TH APRIL, 1957.

Particulars may be obtained from the Department of Medical Postgraduate Studies, The University, Bristol, 8.

TANCRED'S STUDENTSHIPS

DIVINITY : MEDICINE : LAW

£100 p.a. each. For men only

About WHITSUNTIDE next the Governors propose to elect 1 Student in Law at Lincoln's Inn. Candidates must have been born in England, Scotland or Wales and be members of the Church of England and unmarried.

Candidates must be within the ages of 20 and 23 years on 1st October, 1957. The last day for sending in Petitions is 12th March, 1957.

Further announcements relating to the Physic and Divinity Studentships awarded by this Foundation will appear in April and September, 1957.

Apply for further particulars and form of Petition stating kind of Studentship and mentioning this paper to the Clerk, R. M. C. HOWARD, Esq., D.S.O., 28, Lincoln's Inn-fields, London, W.C.2.

THE ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE

THE DIPLOMA IN PUBLIC HEALTH
THE DIPLOMA IN INDUSTRIAL HEALTH

The next COURSES OF INSTRUCTION for the above Diplomas will commence on 15TH MARCH, 1957. Tuition may be taken whole-time or part-time.

Prospectuses, enrolment forms and full details may be obtained from the Secretary, 28, Portland-place, London, W.1 (telephone: LANgham 2731/2).

FACULTY OF RADIOLOGISTS

D.M.R.D. AND D.M.R.T. (R.C.P. LOND., R.C.S. ENG.)

The next COURSES in London for candidates for the D.M.R.D. or D.M.R.T. (R.C.P. Lond., R.C.S. Eng.), organised by the Faculty in coöperation with Medical Schools and Hospitals of the University of London, Metropolitan Regional Hospitals, and the British Postgraduate Medical Federation, will commence in OCTOBER, 1957. The courses are full-time (fee 85 guineas).

Application forms and further particulars may be obtained from the Assistant Director, British Postgraduate Medical Federation, 18, Guilford-street, London, W.C.1, to whom all inquiries should be addressed. The closing date for application from overseas is 31st May, 1957.

THE WELSH NATIONAL SCHOOL OF MEDICINE
(UNIVERSITY OF WALES)

WILLIAM SHEEN MEMORIAL LECTURE

The Sixth William Sheen Memorial Lecture will be given by Sir HARRY PLATT, LL.D., M.D., M.S., F.R.C.S., F.A.C.S., President of the Royal College of Surgeons of England and Emeritus Professor of Orthopædic Surgery in the University of Manchester, on WEDNESDAY, 6TH MARCH, 1957, at 8 P.M. in the Reardon-Smith Lecture Theatre, Park-place, Cardiff.

The Lecture is entitled "The Backache-Sciatica Problem."

THE MIDDLESEX HOSPITAL MEDICAL SCHOOL

LEVERHULME RESEARCH SCHOLARSHIP IN CLINICAL MEDICINE

Applications are invited for a Leverhulme Research Scholarship, value £1000 p.a., plus superannuation. The Scholarship shall be for 1 year in the first instance. The scholar must satisfy the Middlesex Hospital Medical School that the major part of his time will be spent in research, but he may be allowed to hold other appointments. The work may be related to any branch of medicine, must be essentially clinical and will be carried out in the Institute of Clinical Research attached to the Middlesex Hospital Medical School.

Applications, with the names of 2 referees, and a summary of the proposed work, should reach the Secretary of the Institute of Clinical Research, The Middlesex Hospital Medical School, 40, Hanson-street, London, W.1, not later than 12th March, 1957.

CLARE COLLEGE

HARRISON WATSON STUDENTSHIP FOR MEDICAL RESEARCH

The Governing Body of Clare College, Cambridge, invite applications for a Harrison Watson Studentship commencing on 1ST OCTOBER, 1957. The Studentship, which is open to male graduates of any University in any country, is for research or training in research " into the causes and cure of tuberculosis, and/or other diseases of an allied character." The Governing Body intend to interpret these terms in the widest possible sense and they invite detailed enquiries.

The Studentship may be :—

(i) a Junior Studentship of value between £500 and £650 a year, normally tenable for 3 years, or

(ii) a Senior Studentship of value between £800 and £1000 a year, tenable for 1, 2, or 3 years.

The Student may also hold another award or post, and may engage in a limited amount of teaching, if in the opinion of the Governing Body these do not interfere with his research. The Student will be required to become a member of Clare College and the University of Cambridge, and to reside and work in Cambridge.

Applications should contain an account of the applicant's career, and a general statement of his proposed course of research. No testimonials need be submitted, but the names and addresses of not fewer than 2 referees should be sent. Applications and enquiries should be addressed to the Master, Clare College, Cambridge. The closing date for application is 31st March, 1957.

THE ROYAL SOCIETY

GOVERNMENT GRANT FOR SCIENTIFIC INVESTIGATIONS

Applications for grants from the first allotment of the Government Grant for Scientific Investigations for the year 1957 should be made as soon as possible on forms of application to be obtained from the Assistant Secretary of the Royal Society, Burlington House, London, W.1. No application can be considered which is received later than 31ST MARCH, 1957.

Applicants must be of British nationality, resident in Great Britain or Northern Ireland. Grants may be made for purposes in connection with the promotion and support of research in pure science other than for personal maintenance or payment of stipends ; for the assistance of scientific expeditions and collections ; but not in aid of scientific publications.

EMPIRE RHEUMATISM COUNCIL. Applications are invited for 2 EMPIRE RHEUMATISM COUNCIL FELLOWSHIPS, at a salary, according to qualifications and experience, of up to £1500 p.a., renewable annually for a period of 3 years, to prosecute research in the field of rheumatism.

Medical or scientific qualifications are needed and the applications, stating age, qualifications and experience together with details of proposed research, should be sent with the names of 2 referees to the General Secretary, Empire Rheumatism Council, Tavistock House (N), Tavistock-square, London, W.C.1.

Further information available on application to the above.

UNIVERSITY OF LONDON. The Senate invite applications for the READERSHIP IN CHEMICAL PATHOLOGY tenable at King's College Hospital Medical School (salary within the range £1900–£2400 or £1450–£2050 according to qualification).

Applications (10 copies) must be received not later than 12th March, 1957, by the Academic Registrar, University of London, Senate House, W.C.1, from whom further particulars may be obtained.

UNIVERSITY OF GLASGOW. Applications are invited for a LECTURESHIP IN ANÆSTHETICS at the Royal Infirmary. Salary according to placement on University scale for clinical teachers. The total salary attached to the post will be made up of half the salary on the appropriate University scale for clinical teachers and half the salary on the National Health Service scale appropriate to the successful candidate's grading.

Applications (12 copies) should be lodged, not later than 8th March, 1957, with the undersigned from whom further particulars may be obtained.

ROBT. T. HUTCHESON, Secretary of University Court.

OHIO STATE UNIVERSITY. Large mid-western university in United States of America offers opportunities for approved training in Pathology and Clinical Pathology and also advanced work in teaching and research as INSTRUCTOR or ASSISTANT PROFESSOR. Salaries range from $2100 to $6000 per year depending upon qualifications.

For further information contact Dr. EMMERICH VON HAAM, Department of Pathology, Ohio State University, Columbus 10, Ohio, U.S.A.

Hospital Services : Senior Appointments

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Part-time CONSULTANT PATHOLOGIST (9 half-days per week) in the St. Helier Group of hospitals, for duties at St. Helier Hospital, Carshalton, Nelson Hospital, S.W.20, and Wimbledon Hospital, S.W.20.

Applications by letter (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 16th March, 1957. Applicants may visit hospitals by local arrangement.

CHICHESTER GROUP. South West Metropolitan REGIONAL HOSPITAL BOARD. Locum RADIOLOGIST (diagnostic) (11 half-days per week) required for a month or so from 24th April pending filling of substantive consultant appointments, 1 senior and the other subordinate. Sessions at St. Richard's, Royal West Sussex (general) and Graylingwell (mental) Hospitals, Chichester, and Bognor Hospital. Remuneration: Consultant £50 per week, Senior Hospital Medical Officer &c., 31½ guineas per week. If part-time would be 5 guineas and 3½ guineas respectively per half-day per week.

Apply Secretary, Hospital Management Committee, 174, Broyle-road, Chichester.

LANCASTER MOOR HOSPITAL, Lancaster. Locum ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer) required for minimum period of 2 months. Furnished accommodation with service available if required for married couple. Salary (Whitley) 31½ guineas per week, less charges for board, &c.

Apply Medical Superintendent.

LEEDS REGIONAL HOSPITAL BOARD. Whole-time Locum appointments :—

(*a*) ASSISTANT ORTHOPÆDIC SURGEON (Senior Hospital Medical Officer scale), Dewsbury and Leeds (initial period of 3 months).

(*b*) ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer scale), Broadgate Hospital, Beverley (until early April).

(*c*) ASSISTANT ANÆSTHETIST (Senior Hospital Medical Officer scale), Pontefract and Goole (initial period of 3 months).

Applications, stating age, qualifications and details of appointments held showing dates, together with the names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, as soon as possible.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

(1) ASSISTANT PHYSICIAN (Consultant), whole-time, Edgware General Hospital, Edgware, Middlesex (638 Beds). The candidate appointed will have charge of the Geriatric Service in the Hendon Group to which he will be expected to devote at least 7 sessions a week. A limited amount of acute medicine in addition. After 5 years option to transfer to maximum sessions.

Applications before 18th March, 1957.

(2) CONSULTANT ANÆSTHETIST, Thoracic Surgical Unit, Clare Hall Hospital, South Mimms, Barnet, Herts. 4 half-days a week clinical time.

Applications before 22nd March, 1957.

Hospitals may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

MANCHESTER. NORTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of Locum Tenens ASSISTANT RADIOLOGIST (Senior Hospital Medical Officer). The post is now available and tenable for 4 or 5 months.

Applications, with names of 2 referees, by 25th February, to Group Secretary, Crumpsall Hospital, Manchester, 8.

MANCHESTER REGIONAL HOSPITAL BOARD. Whole-time Locum ANÆSTHETIST (Senior Hospital Medical Officer) required for approximately 4 months for the Rochdale Group of hospitals. Resident or non-resident. Salary 31½ guineas per week.

Apply at once to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale.

MANCHESTER REGIONAL HOSPITAL BOARD.

(*a*) Whole-time ASSISTANT ORTHOPÆDIC SURGEON (Senior Hospital Medical Officer) to the Rochdale and District Hospital Group, mainly Rochdale Infirmary and Birch Hill Hospital, Rochdale. Special experience required in the treatment of orthopædic cases, fractures and trauma. Appointee will work under general direction of Consultant Orthopædic Surgeon. 7th March, 1957.

(*b*) Whole-time or maximum Part-time ASSISTANT ANÆSTHETIST (Senior Hospital Medical Officer) to the Bury and Rossendale Group of hospitals (mainly at Bury General Hospital, acute, 180 Beds). Wide experience, higher qualification essential; appointee to live near main hospital and to work under general guidance of Consultant. 5th March, 1957.

(*c*) Whole-time ASSISTANT PATHOLOGIST (Senior Hospital Medical Officer) to the Preston and Chorley Group of hospitals, mainly at Preston Royal Infirmary (acute, 400 Beds). Experience in all branches of hospital pathology desirable. Successful candidate will work under general guidance of Consultant. 6th March, 1957.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by dates stated.

NEWCASTLE REGIONAL HOSPITAL BOARD. West CUMBERLAND GROUP OF HOSPITALS. Locum SURGEON. Whole-time or maximum part-time for period of 2 or 3 months from 1st April, 1957. Remuneration at Consultant or Senior Hospital Medical Officer level according to grading of successful applicant.

Applications, with names of 3 referees, to be sent immediately to Senior Administrative Medical Officer, 72, Warwick-road, Carlisle, from whom further particulars may be obtained.

OXFORD REGIONAL HOSPITAL BOARD. Consultant PATHOLOGIST (whole-time) to the Reading Area Department of Pathology. Applicants should be experienced in all branches of clinical pathology with a special interest in morbid anatomy. A higher qualification in medicine or surgery is desirable. The successful candidate, if sufficiently experienced, will be in charge of the Pathological Services of the area.

Further information may be obtained from the Secretary, Oxford Regional Hospital Board, 43, Banbury-road, Oxford, to whom applications (12 copies) should be sent, giving full details of qualifications, experience, &c., with the names of 3 referees, by 15th March, 1957.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of CONSULTANT PHYSICIAN in charge of wards at the Royal Infirmary, Glasgow. The appointment will be part-time on the basis of 7 notional half-days per week.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, not later than 30 days after the publication of this advertisement.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Locum SENIOR RADIOLOGIST required for duties based on the Western Infirmary, Glasgow, for the period June–September. Salary grading according to experience.

Applications, naming 3 referees, to the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time CONSULTANT PSYCHIATRIST required to be designated Medical Superintendent of Balderton Hospital, near Newark, a new Hospital (approximately 800 Beds) for all grades of mental defectives, the first part of which (282 Beds) will be ready for occupation in July next. A house is now being built for the Medical Superintendent.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 16th March, 1957.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR ASSISTANT PSYCHIATRIST required for Saxondale Hospital, Radcliffe-on-Trent, Notts. House available. Salary scale £1575–£50–£2025.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 16th March.

WEST CORNWALL CLINICAL AREA. South-Western REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a Whole-time CONSULTANT PSYCHIATRIST to the West Cornwall Clinical Area. Applicants must possess a higher qualification. The successful candidate will work mainly at St. Lawrence's Hospital, Bodmin; in addition he will be required to visit other hospitals in the Clinical Area as determined by the Regional Board from time to time. Residential accommodation is available for a married man.

Applications (12 copies), stating date of birth, qualifications and experience together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 9th March, 1957.

NEW ZEALAND. PALMERSTON NORTH HOSPITAL BOARD, PALMERSTON NORTH, NEW ZEALAND. Applications are invited for the position of ASSISTANT RADIOLOGIST in the Diagnostic X-ray Department at the Palmerston North Hospital, New Zealand. Applicants must have had practical experience in diagnostic radiology in order to qualify for grading as a Junior Specialist under the Hospital Employment (Medical Officers) Regulations. Salary £(N.Z.)1600–£(N.Z.)1900 p.a. Conditions of appointment are obtainable from the Offices of the New Zealand Government, 415, Strand, London, W.C.2.

Applications, giving full particulars as to age, qualifications and experience and accompanied by recent testimonials and advice as to the earliest date on which appointment could be taken up, to be addressed to the Secretary, Palmerston North Hospital Board, P.O. Box 607, Palmerston North, New Zealand, and will be received until 5 P.M. on 22nd March, 1957.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Whole-time PATHOLOGIST-IN-CHARGE (Consultant) at the Royal Surrey County Hospital, Guildford, Surrey.

Applications by letter (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 16th March, 1957. Applicants may visit Hospital by local arrangement.

B.W.I. UNIVERSITY COLLEGE HOSPITAL OF THE WEST INDIES. Applications are invited for the post of RADIOLOGIST at the above-named Hospital which is in special relationship with the University of London. The contract will be for 3 years in the first instance, renewable, and the salary will be at the rate of £2000 p.a., together with an allowance of £250 p.a. from the University College in respect of teaching duties. The appointment will be full-time and the holder of the post will be required to contribute 5% of his salary to the Hospital's superannuation scheme. The Radiologist will be provided with an unfurnished house for which he will be charged rental at the rate of 5% of his salary.

Applications (6 copies), stating full details of qualifications, present post and previous experience, together with the names and addresses of 3 referees, should be sent, not later than 15th March, to the Hospital Manager and Secretary, University College Hospital, Mona P.O., Jamaica, B.W.I., from whom further information may be obtained.

Hospital Services : Junior Appointments

CONNAUGHT HOSPITAL, Walthamstow, E.17. (118 Beds.) Applications are invited for post of RESIDENT ANÆSTHETIST (graded Senior House Officer). Salary £745 p.a., less £150 p.a. for board, lodging, &c. Recognised for D.A. and F.F.A.R.C.S.

Applications, stating age, qualifications and experience together with copies of 2 recent testimonials, should be sent immediately to Secretary, Hospital Management Committee, Forest Group, Langthorne-road, E.11.

DREADNOUGHT SEAMEN'S HOSPITAL, Greenwich, S.E.10. 2 HOUSE SURGEONS (pre-registration) required on 18th February and 14th March, 1957.

Applications, stating age, nationality, qualifications and experience, and giving the names of 3 recent referees, should be sent to the Secretary as soon as possible.

DULWICH HOSPITAL, East Dulwich-grove, S.E.22. SENIOR HOUSE OFFICER (pathology). Resident post for 6 months in first instance.

Applications, giving age, qualifications and previous posts, with copy testimonials or names of referees, to Group Secretary, Camberwell Hospital Management Committee, Dulwich Hospital, not later than 27th February.

EASTERN HOSPITAL (Fevers), London, E.9. Applications are invited for appointment as registered RESIDENT HOUSE PHYSICIAN. Duties may include some work in Chest Unit. Facilities for postgraduate study for higher qualifications.

Applications to Group Secretary, Hackney Hospital, London, E.9, by 23rd February, quoting EH/HO.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from registered Women medical practitioners for the post of RESIDENT PATHOLOGIST. Salary in accordance with Ministry of Health scale for Senior House Officers. The appointment is for 6 months in the first instance. Duties to commence 1st April, 1957.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, Elizabeth Garrett Anderson Hospital, by 20th February.

FINCHLEY CHEST CLINIC, 980, High-road, N.20. North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR required at above Clinic. Duties include work at Highlands General Hospital (Chest Unit). Good training in general medicine essential and experience in chest diseases desirable. Clinic may be visited by direct appointment.

Application forms obtainable from, and returnable to, the Secretary, Northern Group Hospital Management Committee, Royal Northern Hospital, N.7, by 27th February, 1957.

GERMAN HOSPITAL, London, E.8. (General—157 Beds.) Applications are invited for the 6 months resident appointment of Pre-registration HOUSE SURGEON as from 17th March, and should be sent to the Group Secretary, Hackney Hospital, London, E.9, by 28th February, quoting GH/PHS.

METROPOLITAN EAR, NOSE AND THROAT HOSPITAL AT ST. MARY ABBOTS HOSPITAL, Marloes-road, Kensington, W.8. 2 HOUSE SURGEONS (E.N.T.) required 1st March, 1957. Posts recognised for D.L.O. Resident appointments for 6 months in first instance.

Applications by 25th February, 1957, on forms obtainable from the Hospital Secretary (L. 187), St. Mary Abbots Hospital.

HAMPSTEAD GENERAL HOSPITAL, Haverstock Hill, N.W.3. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from suitably qualified medical practitioners for the post of CLINICAL ASSISTANT to the Ophthalmic Department (part-time Medical Officer grade) for 2 sessions a week, Wednesday mornings and Friday afternoons, commencing 1st March, 1957.

Application forms may be obtained from the Secretary, to whom they should be returned immediately.

HAMPSTEAD GENERAL HOSPITAL, Haverstock Hill, N.W.3. (ROYAL FREE HOSPITAL GROUP.) Applications are invited for the following pre-registration posts :—

HOUSE PHYSICIAN.
HOUSE SURGEON.

Both vacant 1st April, 1957, and tenable for a period of 6 months.

Application forms may be obtained from the Secretary, to whom they should be returned together with copies of 3 recent testimonials, by 28th February, 1957.

HAMPSTEAD GENERAL HOSPITAL, Haverstock Hill, N.W.3. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from registered medical practitioners for the post of RESIDENT CASUALTY OFFICER (graded as Senior House Officer). Salary £745 p.a. Vacant 1st April, 1957, tenable for a period of 6 months at the Main Outpatients' Department, Bayham-street, N.W.1.

Application forms may be obtained from the Secretary, to whom they should be returned together with copies of 3 recent testimonials, by 28th February, 1957.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited from registered medical practitioners for the appointment of REGISTRAR (non-resident) at The National Hospital, Queen-square, W.C.1, for work in the Outpatients Department. This post carries the grade of Registrar. The appointment will be for 1 year in the first instance.

Applications, with names of 3 referees, to be sent to the undersigned not later than 28th February, 1957.

H. EWART MITCHELL,
Secretary to the Board of Governors.

The National Hospitals for Nervous Diseases,
Queen-square, London, W.C.1.

NEW CROSS GENERAL HOSPITAL (Guy's Unit), Avonley-road, S.E.14. Locum ANÆSTHETIC REGISTRAR (part-time up to 8 sessions) required immediately for indefinite period. Previous experience essential. Resident or non-resident.

Apply, with particulars, to Group Secretary, Bermondsey and Southwark Group Hospital Management Committee, New Cross General Hospital, Avonley-road, London, S.E.14.

NORTH MIDDLESEX HOSPITAL, Edmonton, N.18. Locum REGISTRAR in Surgery required, for indefinite period starting 26th February. Higher qualifications in surgery desirable. Work consists mainly of general and traumatic surgery.

Application, with all particulars, to Secretary of Hospital, immediately.

NORTH MIDDLESEX HOSPITAL, Edmonton, N.18. HOUSE PHYSICIAN (post-registration), resident, required for 1st April, for 6 months. General medicine.

Applications, stating age, nationality, qualifications, experience, with copies of recent testimonials, to Secretary of Hospital, by 26th February.

NORTH MIDDLESEX HOSPITAL, Edmonton, N.18. SENIOR HOUSE OFFICER for Psychiatric Unit, resident. The Unit, which is complete from every point of view and includes a small observation ward, is run in association with St. Bartholomew's Hospital and Claybury Hospital. The appointment, which is recognised for the D.P.M. and offers admirable opportunities for a young Physician anxious to specialise in psychological medicine, is for 6 months from 1st April, with possible extension to 1 year.

Applications, stating age, nationality, qualifications, experience, with copies of recent testimonials and names of 2 referees, to Secretary of Hospital, by 26th February.

QUEEN CHARLOTTE'S AND CHELSEA HOSPITALS. CHELSEA HOSPITAL FOR WOMEN, DEPARTMENT OF PATHOLOGY. Applications are invited for the post of REGISTRAR in Pathology. Previous experience is desirable and details of the post can be obtained from the Director of the Department. The post is non-resident.

Applications to the House Governor within 14 days of publication of this advertisement, on forms obtainable from 339, Goldhawk-road, London, W.6.

QUEEN ELIZABETH HOSPITAL FOR CHILDREN MANAGEMENT COMMITTEE, Hackney-road, E.2, Shadwell, E.1, and BANSTEAD WOOD, SURREY. HOUSE OFFICER. Appointment will be made for 2 consecutive periods of 6 months commencing 1st April, 1957. First period as House Physician and second as House Surgeon and Casualty Officer.

Application forms may be obtained from the Secretary at Hackney-road and should be returned with copies of not more than 3 testimonials on or before 23rd February, 1957.

PADDINGTON GENERAL HOSPITAL, Harrow-road, W.9. (582 Beds.) Applications are invited for the post of Whole-time REGISTRAR in Anæsthetics (non-resident). The post is recognised for the D.A. and F.F.A.R.C.S. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary to Committee, Paddington General Hospital, Harrow-road, W.9, by 28th February.

PLAISTOW HOSPITAL, Samson-street, London, E.13. (185 Beds.) Applications are invited for the appointment of RESIDENT HOUSE OFFICER (post-registration or pre-registration second post), for 6 months commencing 1st April, in the Chest Unit and Infectious Diseases Unit. Some experience in diseases of the chest desirable. The position offers good opportunities for experience in general medicine.

Applications, with copies recent testimonials, to Hospital Secretary by 27th February.

PLAISTOW MATERNITY HOSPITAL, Howards-road, Plaistow, London, E.13. RESIDENT OBSTETRIC OFFICER (House Officer, post-registration) required for 6 months commencing 1st April, 1957.

Apply to Hospital Secretary, not later than 1st March, enclosing copies of 2 recent testimonials.

PUTNEY HOSPITAL, Lower Common, S.W.15. House SURGEON (resident), vacant 18th March, 1957. Open to registered practitioners and pre-registration candidates.

Apply Hospital Secretary, enclosing copies of 3 recent testimonials, by 27th February, 1957.

PUTNEY HOSPITAL, Lower Common, S.W.15. Casualty OFFICER, FRACTURE HOUSE SURGEON (non-resident), vacant 18th March, 1957. Senior House Officer grade. Recognised F.R.C.S.

Apply Hospital Secretary, enclosing copies of 3 recent testimonials, by 27th February, 1957.

PUTNEY HOSPITAL, Lower Common, S.W.15. Casualty OFFICER, E.N.T. HOUSE SURGEON, vacant 10th April, 1957. Recognised F.R.C.S.

Apply Hospital Secretary, enclosing copies of 3 recent testimonials, by 27th February, 1957.

ROYAL EYE HOSPITAL, S.E.1. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER from 1st April, 1957.

Request for application form should be made to the Secretary, The Royal Eye Hospital, St. George's-circus, London, S.E.1.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234, Great Portland-street, London, W.1. Applications are invited for the appointment of SENIOR ORTHOPÆDIC REGISTRAR (full-time), non-resident. Applicants must be Fellows of 1 of the Royal Colleges of Surgeons. During the tenure of office 1 year may be spent at the Luton and Dunstable Hospital and 6 months at The Hospital for Sick Children, Great Ormond-street. In the event of a Registrar of the Royal National Orthopædic Hospital being appointed to the above vacancy, there will be a vacancy for the post of Registrar and applicants may, therefore, apply for either post.

Applications to be received not later than 2nd March. Forms of application can be obtained from the House Governor, 234, Great Portland-street, London, W.1.

SOUTH EAST METROPOLITAN REGIONAL HOS-PITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in General Surgery to fill a vacancy in the approved trainee establishment at the Lewisham Group of hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications, and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 2nd March, 1957.

SOUTH WESTERN HOSPITAL, Landor-road, S.W.9. LAMBETH GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from Women candidates, for the post of HOUSE SURGEON (pre-registration) at the above Hospital. Duties include general surgery and the successful applicant will also be required to provide relief for leave of the House Surgeon at the Annie McCall Maternity Hospital.

Application forms from the Hospital Secretary, to be returned not later than 1st March, 1957.

ST. GILES' HOSPITAL, Camberwell, S.E.5. House SURGEON (casualty duties, with some general surgical, E.N.T. and eye beds). Recognised pre-registration post, vacant from 10th March, 1957.

Applications, with copy testimonials or names of referees, to Group Secretary, Camberwell Hospital Management Committee, Dulwich Hospital, East Dulwich-grove, S.E.22, not later than 28th February.

ST. JAMES' HOSPITAL, Balham, S.W.12. South West METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR (E.N.T.), resident, post vacant 1st April.

Application forms, obtainable from Group Secretary, Wandsworth Hospital Group, at above address, to be completed and returned by 2nd March. (0132.)

ST. JAMES' HOSPITAL, Balham, S.W.12. South West METROPOLITAN REGIONAL HOSPITAL BOARD. Part-time OPHTHALMIC REGISTRAR (7 sessions per week) for inpatients and outpatients. Post vacant 21st April.

Application forms, obtainable from Group Secretary, Wandsworth Hospital Group, at above address, to be completed and returned by 9th March. (0137.)

ST. JAMES' HOSPITAL, Balham, S.W.12. Locum E.N.T. REGISTRAR required immediately until permanent appointment made.

Applications, giving full particulars and names of 2 referees, to Group Secretary at above address immediately. (0152.)

ST. MARY'S HOSPITAL, Paddington, W.2. Applications are invited for the post of Part-time REGISTRAR to the Psychiatric Department (6 notional half-days per week). Previous experience in psychiatry is necessary; preference will be given to candidates holding the D.P.M. The appointment will be for a first period of 12 months as from a date to be arranged; remuneration at Registrar rates.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, details and National Health Service gradings of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 5th March, 1957.

ST. STEPHEN'S HOSPITAL, Chelsea, S.W.10. South WEST METROPOLITAN REGIONAL HOSPITAL BOARD. MEDICAL REGISTRAR (general medical duties), non-resident.

Application forms obtained from the Group Secretary, St. Luke's Hospital, Sydney-street, London, S.W.3, to be returned within 14 days of date of advertisement (enclose foolscap stamped addressed envelope).

ST. STEPHEN'S HOSPITAL, Chelsea, S.W.10. House PHYSICIAN (post-registration), resident. General medicine and some tuberculosis. Vacancy 13th April, 1957.

Applications, naming 2 referees, to Medical Superintendent.

ST. THOMAS'S HOSPITAL, London, S.E.1. Department OF VENEREAL DISEASES. Temporary JUNIOR HOSPITAL MEDICAL OFFICER, for a period of 6 months commencing from May, 1957, to carry out 8 half-day sessions per week.

Applications, naming 2 referees, to the Clerk of the Governors, by 28th February, 1957.

WHIPPS CROSS HOSPITAL, London, E.11. Applications are invited for the post of Pre-registration HOUSE SURGEON (general surgery), vacant now.

Application forms from the Hospital Secretary to be returned by 25th February, 1957.

WHIPPS CROSS HOSPITAL, London, E.11. Leytonstone (NO. 10) HOSPITAL GROUP. Applications are invited for the post of SENIOR HOUSE OFFICER (Casualty Officer) at above Hospital. This post, which is recognised by the Royal College of Surgeons for 6 months casualty training under the Fellowship regulations, becomes vacant 1st March, 1957.

Application forms from the Hospital Secretary to be returned by 25th February, 1957.

WHIPPS CROSS HOSPITAL, London, E.11. Leytonstone (NO. 10) HOSPITAL GROUP. Applications are invited from fully registered medical practitioners for the post of HOUSE PHYSICIAN (post-registration) in the Pædiatric Department at above Hospital. Post recognised for D.C.H.

Application forms from the Hospital Secretary to be returned by 25th February, 1957.

WHITTINGTON HOSPITAL, London, N.19. Registrar required for E.N.T. Department (30 Beds). Post recognised for F.R.C.S. and D.L.O. Vacant now. Considerable experience in laryngology desirable as the post is a responsible one. Department takes part in postgraduate teaching. Hospital may be visited by direct appointment. Post is non-resident but successful candidate will be required to sleep in the Hospital on alternate nights and alternate week-ends.

Application forms obtainable from, and returnable to, the Group Secretary, 46, Cholmeley-park, Highgate, London, N.6, by 25th February, 1957.

WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY, 91, Dean-street, W.1. CLINICAL ASSISTANT to Ophthalmologist required for 1 half-day per week (Friday morning). Salary £175 p.a.

Applications, with details of experience, &c., together with names and addresses of 2 referees, to Hospital Secretary by 21st February. 1957.

WESTMINSTER HOSPITAL, St. John's Gardens, S.W.1, AND KINGSTON HOSPITAL, 26, Wolverton-avenue, KINGSTON-ON-THAMES, SURREY. Joint appointment of SENIOR REGISTRAR in Obstetrics and Gynæcology. Applications invited for above post to start 1st April, 1957. Annual appointment up to 4 years. Successful candidate will work approximately 2 years at each Hospital. Candidates must be either F.R.C.S. or M.R.C.O.G.

Applications (14 copies), with names of 3 referees, to reach House Governor, Westminster Hospital, by 28th February.

ASHFORD HOSPITAL, Ashford, Middlesex. (600 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR in Radiology (whole-time, non-resident) required at above Hospital. Possession of a radiological qualification essential. Successful candidate required to work part-time at another hospital in the Group. Post vacant 1st April, 1957. Hospital may be visited by direct appointment with Medical Director.

Application forms obtainable from, and returnable to, Secretary, Staines Group Hospital Management Committee, Ashford Hospital, Ashford, Middlesex, by 26th February, 1957.

ASHFORD HOSPITAL, Ashford, Middlesex. (560 Beds.) STAINES GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE OFFICER (Male) for general surgical and medical duties. 6 months appointment, not suitable for pre-registration candidates.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital immediately.

ASHTON, HYDE AND GLOSSOP HOSPITAL MANAGE-MENT COMMITTEE. E.N.T. SURGEON (Senior House Officer grade) required at Ashton-under-Lyne General Hospital, vacant early March.

Applications, stating age, qualifications and experience, with copies of 3 testimonials, to be forwarded to the Group Secretary, General Hospital, Ashton-under-Lyne, Lancs, as soon as possible.

ASHTON, HYDE AND GLOSSOP HOSPITAL MANAGE-MENT COMMITTEE. SENIOR HOUSE OFFICER required to assist Consultant Geriatrician in a Developing Unit which serves the catchment area of the Hospital Management Committee, with main duties at Ashton-under-Lyne General Hospital. There is a full scope for the study of clinical medicine and the post is suitable for a young Physician wishing to work for higher qualifications or interested in social medicine and rehabilitation.

Applications, together with 2 references, to the Group Secretary, General Hospital, Ashton-under-Lyne, Lancs.

AYLESBURY. ROYAL BUCKINGHAMSHIRE HOS-PITAL. CASUALTY OFFICER (Senior House Officer) required mid-March. Post recognised for F.R.C.S. Self-contained furnished flat available at moderate rental.

Apply, with copies of 2 recent testimonials, to Secretary-Superintendent.

AYLESBURY. STOKE MANDEVILLE HOSPITAL. Applications are invited for the post of RESIDENT HOUSE PHYSICIAN in the Department of Medicine. Pre-registration post but registered practitioners may apply. Duties include responsibility for 20 acute medical beds and 15 tuberculosis beds. Post vacant 17th March, 1957.

Apply, with copies of 2 testimonials, to Administrative Officer.

BARNSTAPLE. NORTH DEVON INFIRMARY. (105 Beds.) HOUSE SURGEON required. Recognised pre-registration appointment; the post can be taken up immediately.

Applications to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple.

BOURNEMOUTH (near). CHRISTCHURCH HOS-PITAL, HAMPSHIRE. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT HOUSE SURGEON for general surgery at the above Hospital of 340 Beds which includes a new Surgical Unit of 56 Beds. This is a new appointment which will become available towards the end of March. The successful applicant will be required to attend surgical outpatient sessions at the Royal Victoria Hospital, Boscombe.

Applications to the Hospital Secretary, Christchurch Hospital.

ABERDEEN SPECIAL HOSPITALS BOARD OF MANAGEMENT. Applications are invited for the post of REGISTRAR in Paediatrics (non-resident). The Registrar will have duties in the Royal Aberdeen Hospital for Sick Children, the Aberdeen Maternity Hospital and the Aberdeen City Hospital, and will get experience in dealing with sick children, newborn babies and children with infectious diseases.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names of 3 referees, should be forwarded to the Secretary, Board of Management for the Aberdeen Special Hospitals, 6, Queen's-terrace, Aberdeen, not later than 9th March, 1957.

BARNSLEY. BECKETT HOSPITAL. (174 Beds. Recognised for the F.F.A.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT REGISTRAR (anæsthetics) required with duties also at St. Helen Hospital, Barnsley (225 Beds). Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 25th February, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

BARNSLEY. BECKETT HOSPITAL. (174 Beds. Recognised for training for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SURGICAL REGISTRAR required. Married accommodation available. Post vacant 1st April. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 25th February, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

BARROW-IN-FURNESS. DEVONSHIRE ROAD HOSPITAL. SENIOR HOUSE OFFICER (paediatrics), resident, required on or about 1st April, 1957, to a new Paediatric Unit opening at the above Hospital. The post will provide good inpatient and outpatient experience in paediatrics, and will also include the care of a ward for medical cases (adults) and infectious diseases (children and adults).

Applications, giving age, details of experience, and names of 2 referees, to the Group Secretary, Barrow and Furness Hospital Management Committee, 105, Abbey-road, Barrow-in-Furness.

BEBINGTON, CHESHIRE. CLATTERBRIDGE HOSPITAL. (819 Beds.) CENTRAL WIRRAL GROUP. 3 HOUSE OFFICERS (general surgery) for pre-registration posts, 6 months commencing 1st March, 1957. Salary according to previous posts held.

Application forms, obtainable from Hospital Secretary, to be returned as soon as possible.

BEDFORD (near). BROMHAM HOSPITAL. (434 Beds for Mental Defectives and 60 at Annexe near Sandy.) JUNIOR HOSPITAL MEDICAL OFFICER (psychiatry) required. Post may be non-resident and for 4 years in the first instance. Hospital may be visited by direct appointment with the Psychiatrist-Superintendent (Phone : Oakley 295).

Application forms obtainable from, and returnable to, Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford, by 23rd February, 1957.

BEDFORD GENERAL HOSPITAL. (439 Beds.) House SURGEON required. Pre- or post-registration. Recognised for F.R.C.S. Post offers exceptional opportunities for general experience in busy acute Surgical Units.

Inquiries and applications, with copies of 2 recent testimonials, to Group Secretary, 3, Kimbolton-road, Bedford.

BEDFORD GENERAL HOSPITAL. (439 Beds.) Locum RESIDENT CASUALTY OFFICER (Registrar grade) required 4th–31st March, 1957. Salary £17 10s. per week.

Applications and testimonials to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford, as soon as possible.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. ASSISTANT PATHOLOGIST (Senior House Officer grade) required in Area Laboratory. Offers experience all branches of pathology. Salary £745.

Detailed applications to Group Secretary.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 acute beds.) ORTHOPÆDIC HOUSE SURGEON (first, second, or third post) vacant end February. Offers good opportunity for general experience in busy acute general hospital. Approved pre-registration post. Fully qualified practitioners may apply. Recognised for F.R.C.S.

Apply Group Secretary.

BIDEFORD AND DISTRICT HOSPITAL, North Devon. (51 Beds.) SENIOR HOUSE OFFICER required for medical and surgical duties. Married accommodation available in the Hospital.

Applications, stating age, qualifications and experience, and naming 2 referees, to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple.

BISHOP AUCKLAND, co. DURHAM. THE GENERAL HOSPITAL. (350 Beds.) SOUTH WEST DURHAM HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required. Recognised pre-registration post.

Apply, naming 2 referees, to K. G. T. LUXFORD, Group Secretary, at the above address.

BISHOP'S STORTFORD, HERTFORDSHIRE. HERTS AND ESSEX GENERAL HOSPITAL. (400 Beds. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited from registered medical practitioners for the appointment of a Whole-time Temporary SURGICAL REGISTRAR to commence immediately on a week by week basis.

Applications, giving full details, together with copies of recent testimonials or the names of referees, to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

BIRMINGHAM ACCIDENT HOSPITAL, Bath-row, BIRMINGHAM, 15. (215 Beds and 8 House Surgeons.) HOUSE SURGEONS (resident), vacant February. Hospital largest Traumatic Unit in country and treats over 50,000 new patients each year. Recognised for purpose of Casualty by R.C.S.(Eng.). Teaching programme by Consultant staff. 6 months appointment, some of which can be spent in 42-Bedded Medical Research Council's Burns Unit.

Apply, naming 2 referees, to Administrator within 7 days.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. E.N.T. DEPARTMENT. HOUSE SURGEON or SENIOR HOUSE SURGEON (resident). Recognised for D.L.O. Busy hospital of 780 Beds, 50 E.N.T. beds.

Applications, with copies of 2 recent testimonials, to Group Secretary.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) **South Worcestershire Group, Worcester Royal Infirmary**

REGISTRAR (resident) for St. Wulstan's Hospital, Malvern (230 Beds). Good training general medicine required. Hospital mainly for pulmonary tuberculosis with 30 Beds for thoracic surgery.

(2) **Stoke-on-Trent Group, Princes-road, Stoke-on-Trent**

REGISTRAR (E.N.T. surgery) for City General Hospital (44-Bedded department). Large outpatients clinic. Post recognised F.R.C.S. and D.L.O. Experience specialty essential. Resident or non-resident. Vacant 1st March, 1957.

(3) **Coventry No. 20 Group, Stoney Stanton-road, Coventry**

REGISTRAR (ophthalmology). Recognised D.O., F.R.C.S. Experience specialty essential. Non-resident.

(4) **Highcroft Hall Group 7, Highcroft Hall Hospital, Birmingham, 23**

REGISTRAR (psychiatry). All modern forms of treatment. Opportunities for outpatients clinic work. House available.

(5) **Dudley Stourbridge Group, The Guest Hospital, Dudley**

REGISTRAR (general surgery) for The Guest Hospital (154 Beds). Experience specialty essential. Higher qualification desirable. Resident.

(6) **Wolverhampton Group, The Royal Hospital, Wolverhampton**

REGISTRAR (general medicine) for New Cross Hospital, Wolverhampton (627 Beds). Resident post.

Application forms from Group Secretaries, to be returned by 25th February, 1957 (in the case of No. 6 1st March, 1957).

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE BIRMINGHAM AND MIDLAND HOSPITALS FOR WOMEN (incorporating the Hospital for Women and the Birmingham Maternity Hospital), Showell Green-lane, SPARKHILL, BIRMINGHAM, 11. Applications are invited for the post of RESIDENT OBSTETRICAL AND GYNÆCOLOGICAL REGISTRAR vacant 1st July, 1957. The successful candidate will be required to alternate duty at the Hospital for Women and the Maternity Hospital, for specified periods. The post is recognised for the M.R.C.O.G., and applicants should have held House appointments and at least 1 obstetrical and gynæcological post.

Forms of application may be obtained from, and should be returned not later than 18th March, 1957, to the House Governor at the above address. G. A. PHALP, Secretary.

BIRMINGHAM (near). THE MIDLAND CENTRE FOR NEUROSURGERY, Holly-lane, SMETHWICK, near BIRMINGHAM. (75 Beds.) SENIOR HOUSE OFFICER (resident). Appointment for 1 year, or 6 months (renewable), tenable in medical neurology and neurosurgery.

Applications, with names of 2 referees, to the Group Secretary, West Bromwich and District Hospitals Management Committee.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE OFFICER (obstetrics and gynæcology) at Rossendale General Hospital, Rawtenstall.

Applications, together with the names of 2 referees, should be sent to H. WILKINSON, Group Secretary.

Bury General Hospital, Bury, Lancs.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (312 Beds.) HOUSE SURGEON required 21st February, 1957. Recognised for pre-registration and F.R.C.S.

Applications, stating usual particulars and naming 2 referees, to the Administrative Officer.

BRIGHTON. SUSSEX EYE HOSPITAL. (56 Beds.) HOUSE SURGEON required at the above Hospital, vacant 1st March. Recognised for F.R.C.S. and D.O. Successful applicant will be considered for senior post (Senior House Officer) on completion of 6 months.

Applications, stating age, qualifications and experience and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRISTOL. WINFORD ORTHOPÆDIC HOSPITAL. (230 Beds.) SENIOR HOUSE OFFICER. Applications are invited from registered medical practitioners for this post vacant April, 1957. Suitable for candidate reading for higher grade qualification and recognised for F.R.C.S. Hospital is staffed by Consultants of teaching hospital.

Apply, stating age, qualifications and experience with testimonials, to Secretary.

BRISTOL. SOUTHMEAD GENERAL HOSPITAL GROUP MANAGEMENT COMMITTEE. Required immediately at Southmead Hospital (570 Beds—including 133 maternity) RESIDENT SENIOR HOUSE OFFICER (pathology). General experience in clinical pathology, including blood transfusion duties. (There is a possibility of a further year's appointment with basic training in morbid anatomy.)

Applications to be submitted to the Group Secretary, Southmead Hospital, Bristol.

BRISTOL. SOUTHMEAD GENERAL HOSPITAL. SENIOR HOUSE OFFICER required in the Department of Urology, which is associated with the University of Bristol Medical School, at Southmead Hospital, Bristol (570 Beds).

Applications to be submitted to the Group Secretary.

CAMBRIDGE. THE UNITED CAMBRIDGE HOSPITALS. ADDENBROOKE'S HOSPITAL. CLINICAL ASSISTANT (part-time) in Plastic Surgery for 3 sessions weekly for both outpatient and inpatient duties. Salary £175 p.a. per session. The appointment will be for 1 year in the first instance.

Applications, giving age, qualifications and experience, together with the names of 2 referees, to the Secretary, Addenbrooke's Hospital, Cambridge, by 2nd March, 1957.

CAMBRIDGE. ADDENBROOKE'S HOSPITAL. House OFFICER to Departments of Dermatology, Ophthalmology, and Paediatrics for 6 months from 11th April. Recognised Pre-registration Service (medical).

Apply, stating age, nationality, qualifications, and experience with dates, and copies of 3 testimonials, to the Secretary by 2nd March. Interviews mid-March.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (277 Beds.) E.N.T. AND EYE DEPARTMENTS. SENIOR HOUSE OFFICER. Salary £745 p.a. Post vacant at the end of March, 1957. Approved for F.R.C.S. and special diplomas.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (277 Beds.) The post of GENERAL SURGICAL AND UROLOGICAL HOUSE SURGEON (pre-registration or third post), which is recognised for the F.R.C.S. is now vacant. National Health Service salary and conditions.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CARDIFF (near). CAERPHILLY AND DISTRICT MINERS' HOSPITAL. (226 acute general beds.) HOUSE SURGEONS (2 appointments) now vacant. Preference given to pre-registration candidates. The posts are recognised by the Royal College of Surgeons. 6 miles from the teaching Hospital at Cardiff.

Apply to Group Secretary, address as above.

CARDIFF. THE UNITED CARDIFF HOSPITALS. Applications are invited for the appointment of SENIOR REGISTRAR in the E.N.T. Department at the Cardiff Royal Infirmary.

Application forms are available from the Secretary to the Board at the Cardiff Royal Infirmary, and should be returned within 14 days of the appearance of this advertisement.

CARLISLE. GARLANDS HOSPITAL. (1060 Beds.) GARLANDS HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER at the above Mental Hospital. Resident post. Flat is available for which a deduction will be made. Salary scale £775–£50–£1075 p.a. Appointment subject to the National Health Service superannuation regulations and to the conditions and terms of service laid down by the Minister of Health.

Applications, stating age, qualifications and experience and the names of 2 referees, should be sent to the Medical Superintendent as soon as possible.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. HOUSE SURGEON required on Surgical Unit of 78 Beds. Post recognised for F.R.C.S. examination and approved for pre-registration experience.

Applications, stating age, qualifications, and experience, with copies of recent testimonials and the names of 2 referees, should be sent to the Secretary at above address.

CHELMSFORD AND ESSEX HOSPITAL. Applications are invited for the resident post of CASUALTY OFFICER (Senior House Officer). It is recognised for the F.R.C.S. and offers excellent experience in the treatment of fractures and diagnosis of acute medical and surgical emergencies. Opportunity is given for Casualty Officer to follow up his cases in the wards and to obtain operating experience in major theatre under the guidance of the Consultants or the Resident Surgical Officer. Off duty time is generous and the post is one likely to suit both an officer seeking a higher qualification in surgery or one intending General Practice. The vacancy will occur on 2nd March.

Apply Secretary, Chelmsford Hospital Management Committee, Chelmsford and Essex Hospital, Chelmsford.

CHELMSFORD. ST. JOHN'S HOSPITAL. Applications are invited from registered practitioners for the post of RESIDENT PÆDIATRIC HOUSE OFFICER (Male or Female). Commencing 16th March, 1957, to work in the Pædiatric Unit of the Chelmsford Hospital Group. The Unit includes a Premature Baby Nursery of 10 Cots and a Neo-natal Department in the Maternity Block of the Hospital. The Department is recognised for the D.C.H.

Applications, stating age, nationality, qualifications and experience, together with recent testimonials, should be received not later than 26th February, 1957, by the Group Secretary, Chelmsford Group Hospital Management Committee, Chelmsford and Essex Hospital, London-road, Chelmsford.

CHELTENHAM GENERAL HOSPITAL. (220 Beds.) HOUSE SURGEON required (pre- or post-registration). The post offers a wide experience in general surgery; gynæcology; and orthopædic surgery. Post recognised for the F.R.C.S.

Apply Secretary, General Hospital, Cheltenham.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL (late Botley's Park War Hospital). (430 Beds.) ORTHOPÆDIC HOUSE SURGEON required immediately. Senior House Officer or House Officer (Intern) grade. 100 orthopædic beds. Post recognised for F.R.C.S. and Pre-registration Service. Preference given to provisionally registered candidates. Salary in accordance with terms and conditions of National Health Service.

Applications, together with names and addresses of referees, to be sent to the Physician-Superintendent, St. Peter's Hospital, Chertsey, as soon as possible.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL (late Botley's Park War Hospital). (430 Beds.) RESIDENT HOUSE SURGEON (Senior House Officer or Intern) required for the Gynæcological (30 Beds) and E.N.T. (16 Beds) Departments. Salary in accordance with terms and conditions of National Health Service.

Applications, together with names and addresses of referees, to be sent to the Physician-Superintendent, St. Peter's Hospital, as soon as possible.

CHICHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER in Medicine under supervision of Consultant Physicians with main duties in Geriatric Unit (150 Beds) at St. Richard's Hospital (400 Beds). Facilities are available for investigation and treatment of acute and chronic disease, pre-admission assessment, and follow-up clinic. Post resident or non-resident. National Health Service terms and conditions of service. Salary £775–£50–£1075 p.a.

Applications, stating age, nationality, qualifications, and experience, and naming 2 referees, to Group Secretary.

CHICHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time Locum SENIOR REGISTRAR in General Surgery, wanted for about 3 months from 1st April, 1957, to assist with Consultant work chiefly at Royal West Sussex Hospital. Non-resident.

Apply Group Secretary, 174, Broyle-road, Chichester.

COLCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for :—

Black Notley Hospital, Braintree (516 Beds)

Posts of HOUSE SURGEON and HOUSE PHYSICIAN. The successful applicant will serve 6 months as House Surgeon followed by 6 months as House Physician. First, second, third or pre-registration posts. Surgical post includes duties in general surgical and gynæcological wards. Recognised for F.R.C.S. Medical post includes duties in medical and paediatric ward.

Post of ORTHOPÆDIC HOUSE OFFICER. Duties include care of cases from London Hospital Orthopædic Department. First, second, third or pre-registration post, tenable for 6 months. Recognised for F.R.C.S.

Applications, with copies of 3 testimonials, to Group Secretary, Colchester Hospital Management Committee, 14, Pope's lane, Colchester, Essex.

COLCHESTER. SEVERALLS HOSPITAL. Junior HOSPITAL MEDICAL OFFICER required (resident or non-resident). Commencing salary £775 p.a., rising to £1075 p.a. Furnished accommodation available for a single officer. There will be scope for work in the use of modern psychiatric methods in the wards.

Applications, with names of 2 referees, should be forwarded to the Medical Superintendent.

COVENTRY AND WARWICKSHIRE HOSPITAL, COVENTRY. SENIOR ASSISTANT (Junior Hospital Medical Officer grade) for accident and orthopædic wards. Appointment for 1 year in first instance, renewable annually up to 4 years. Recognised F.R.C.S. Previous experience desirable. Resident accommodation available.

Applications to the Hospital Secretary.

CREWE AND DISTRICT MEMORIAL HOSPITAL. (108 Beds—Acute.) Locum ANÆSTHETIST required for 3 weeks holiday duty (as early as possible). Salary in accordance with Whitley Council scale.

Applications, with full details, giving dates available, immediately to the Group Secretary, Group Headquarters, Barony Hospital, Nantwich, Cheshire.

CROYDON. MAYDAY HOSPITAL. (611 Beds.) Locum Tenens SURGICAL REGISTRAR (whole-time, resident) for period 12th March, 1957–26th March, 1957, inclusive.

Applications in writing to—

GEORGE A. PAINES, Group Secretary,
Croydon Group Hospital Management Committee.
General Hospital, London-road, Croydon.

DARLINGTON MEMORIAL HOSPITAL. Applications are invited from Male or Female practitioners with experience for the post of SENIOR HOUSE OFFICER (surgery). Establishment 1 Registrar, 1 Senior House Officer, 2 House Officers (90 surgical beds). The post is recognised for the F.R.C.S. (Eng.). Salary £745 p.a., deduction of £150 for full residential emoluments. The post is tenable for 12 months and is renewable annually.

Apply with references, stating age and experience, to—

G. W. BECKWITH, Group Secretary.

DERBY. DERBYSHIRE ROYAL INFIRMARY. Senior HOUSE OFFICER (general surgery), vacant now.

Apply immediately, stating full details with copies of 2 recent testimonials, to the Hospital Secretary.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (416 Beds.) HOUSE PHYSICIAN (pre-registration) or SENIOR HOUSE OFFICER (general medicine), vacant early March.

Apply, stating full particulars with copies of 2 testimonials, to the Secretary.

DERBY. DERBYSHIRE HOSPITAL FOR WOMEN, FRIAR GATE, DERBY. HOUSE SURGEON (pre-registration) or SENIOR HOUSE OFFICER (gynæcology). 2 posts—(1) vacant 23rd February, (2) vacant about 27th March. Recognised for M.R.C.O.G. in gynæcology only.

Apply, stating full details and which vacancy, with copies of 2 recent testimonials, to Group Secretary, No. 1 Hospital Management Committee, Babington-lane, Derby.

DOUGLAS. NOBLE'S ISLE OF MAN HOSPITAL. (160 Beds.) Applications are invited for the post of HOUSE SURGEON. The post is recognised for pre-registration purposes, and becomes vacant in mid-March, 1957. 4 residents on staff. Salary £425–£475 according to experience.

Applications, enclosing copies of 2 recent testimonials, to the Secretary, Noble's Hospital, Douglas, Isle of Man.

DRIFFIELD, YORKSHIRE. EAST RIDING GENERAL HOSPITAL. (247 Beds.) HOUSE SURGEON (first, second, or third post), required now. Casualty, general surgery, orthopædics, and some gynæcology. Approved pre-registration post. Fully qualified practitioners may apply.

Apply Group Secretary, Westwood Hospital, Beverley, Yorkshire.

DURHAM. DRYBURN HOSPITAL. (303 Beds.) House SURGEON. Approved pre-registration post and recognised under the F.R.C.S. regulations. Post vacant now.

Apply, with names and addresses of 2 referees, to Group Secretary, Dryburn Hospital, Durham.

EDGWARE GENERAL HOSPITAL. (715 Beds.) North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT PÆDIATRIC REGISTRAR required at above Hospital—32 pædiatric beds. Department is also responsible for the supervision of 64 Cots in Maternity Unit and 50 Cots at Bushey Maternity Hospital. Hospital may be visited by direct appointment with Medical Director.

Application forms obtainable from, and returnable to, Group Secretary, Edgware General Hospital, Edgware, Middlesex, by 23rd February, 1957.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. RESIDENT GYNÆCOLOGICAL HOUSE SURGEON for above Hospital. Post vacant 28th March, 1957. 6 months appointment. Post recognised for M.R.C.O.G. purposes.

Applications, stating age, qualifications, experience and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 2nd March, 1957.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. RESIDENT OBSTETRIC HOUSE SURGEON for above Hospital. Post vacant 2nd April, 1957. 6 months appointment. Post recognised for M.R.C.O.G. purposes.

Applications, stating age, qualifications, experience and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 2nd March, 1957.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. 2 RESIDENT HOUSE SURGEONS for above Hospital. Posts vacant 3rd and 19th April, 1957. 6 months appointments. Posts recognised for F.R.C.S. and pre-registration purposes.

Applications, stating age, qualifications, experience and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 2nd March, 1957.

EDINBURGH. ROYAL EDINBURGH HOSPITAL FOR MENTAL AND NERVOUS DISORDERS BOARD OF MANAGEMENT. Applications are invited for the post of HOUSE OFFICER to the Professorial Unit of the Jordanburn Nerve Hospital which is attached to the Department of Psychological Medicine of Edinburgh University. The post, which ranks as a pre-registration appointment in medicine, entails inpatient and outpatient duties and will be vacant from 1st April, 1957. Accommodation may be available.

Applications, giving details of experience and the names of 2 referees, should be made within 2 weeks of the appearance of this advertisement to the Group Secretary and Treasurer, Royal Edinburgh Hospital, 40, Colinton-road, Edinburgh, 10.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. RESIDENT HOUSE PHYSICIAN (Senior House Officer grade) required 1st May, 1957, for general medical and pædiatric duties. 12 months appointment.

Applications, with names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, at Chase Farm Hospital.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. RESIDENT HOUSE SURGEON (pre-registration post), vacant 26th April, 1957. Duties with General Surgical Unit, doing some genito-urinary work. Post recognised by the Royal College of Surgeons. 6 months appointment.

Applications, with names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, at Chase Farm Hospital.

EPPING. ST. MARGARET'S HOSPITAL. Applications are invited from registered medical practitioners for the posts of HOUSE PHYSICIANS (2) at the above Hospital as from 23rd March, 1957. The appointments, which are in general medicine, are for 6 months, including duties at Honey Lane Hospital for part of this time.

Applications, with 2 recent testimonials, to reach the Group Secretary, Epping Group Hospital Management Committee, "Oak Cottage," The Plain, Epping, Essex, by 22nd February, 1957.

EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, SURREY. SENIOR HOUSE OFFICER (casualty) required 1st April. Post non-resident, recognised for F.R.C.S. 12 months appointment. Busy Casualty and Outpatient Department with excellent experience in minor and traumatic surgery. Candidates should have held previous House Officer posts.

Applications, stating age, qualifications, experience, with copies of 2 recent testimonials, should be sent by 2nd March to Group Secretary at above address.

GALASHIELS. PEEL HOSPITAL. 2 Trainees required as from 1st April, 1957, to alternate for 6-monthly periods between a Partnership Practice in Selkirk and a Senior House Officer appointment in the Orthopædic Department at above Hospital over a total period of 2 years.

Applications to Medical Superintendent, Peel Hospital, Galashiels, from whom full particulars can be obtained.

GREENFORD. PERIVALE MATERNITY HOSPITAL. HOUSE OFFICER, vacant 1st April. Post recognised for Membership and Diploma in Obstetrics. Preference given to person seeking second pre-registration post under the Medical Act, 1950.

Applications, stating age, nationality, qualifications with dates and experience, to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, Middlesex, by 26th February, 1957.

GLASGOW ROYAL INFIRMARY. Senior House Officer in Radiodiagnosis. Duties at above Infirmary.

Write, giving 3 names for reference, not later than 2nd March, 1957, to the Secretary, Board of Management for Glasgow Royal Infirmary and Associated Hospitals, 135, Buchanan-street, Glasgow, C.1.

GLASGOW, N.1. STOBHILL GENERAL HOSPITAL. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER in the Pulmonary Tuberculosis Unit (31 Beds) with an attachment to the associated chest clinic. There are ample opportunities for the study of all forms of chest disease and general medical cases.

Applications, stating age, qualifications, and experience, with the names of 2 referees, to be sent to the Medical Superintendent.

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. (233 Beds.) HOUSE SURGEON for Orthopædic and Traumatic Unit. The post is tenable for 6 months from 11th March and is recognised for the F.R.C.S. examination and open to pre-registration candidates. The unit deals with many traumatic cases.

Applications, with copies of 3 testimonials, should be sent to the Hospital Secretary.

HAREFIELD HOSPITAL, Harefield, Middlesex. Applications are invited for the pre-registration post of HOUSE SURGEON to the general wards at the above Hospital. Vacant immediately.

Applications, with copies of 2 testimonials, to the Medical Director of the Hospital.

HAREFIELD HOSPITAL, Harefield, Middlesex. North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. MEDICAL REGISTRAR in Chest Diseases required at above Hospital. Previous experience in general medicine and in the treatment of tuberculosis essential. The Hospital has approximately 450 Beds for the treatment of tuberculosis in all its forms, a non-tuberculosis Thoracic Surgical Unit of 90 Beds and 100 general medical and surgical beds.

Application forms obtainable from, and returnable to, the Group Secretary, Harefield and Northwood Group Hospital Management Committee, Mount Vernon Hospital, Northwood, Middlesex, by 28th February, 1957.

HARTLEPOOLS HOSPITAL, Hartlepool. Applications are invited for the post of SENIOR HOUSE OFFICER (E.N.T. Department), vacant now.

Applications, stating age, nationality and qualifications with dates, and enclosing copies of 2 testimonials, should be sent to the Group Secretary, Hartlepools Hospitals Management Committee, at the General Hospital, West Hartlepool, as soon as possible.

HARTLEPOOLS HOSPITAL. (133 Beds.) Applications are invited for the post of HOUSE OFFICER (pre-registration) or SENIOR HOUSE OFFICER (Casualty and Orthopædics Department) (recognised for F.R.C.S.), vacant end March. There is also a Senior Casualty Officer in the Group. Married accommodation available.

Applications, stating age, nationality and qualifications with dates, and enclosing copies of 2 testimonials, should be sent to the Group Secretary, Hartlepools Hospitals Management Committee, at the General Hospital, West Hartlepool, as soon as possible.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) HOUSE SURGEON required, pre-registration post, vacant 11th March, 1957.

Apply, with testimonials, to Hospital Administrator, as soon as possible.

HASTINGS AND ST. LEONARDS. BUCHANAN HOSPITAL. (94 Beds.) HOUSE SURGEON in Gynæcology (28 gynæcological beds). Post recognised for M.R.C.O.G., vacant 23rd March, 1957, for 6 months. Candidates for Pre-registration Service (surgery) can be considered.

Apply, giving names and addresses of 3 referees, to Hospital Administrator.

HENLEY-ON-THAMES. PEPPARD CHEST HOSPITAL. (236 Beds.) Applications are invited from registered medical practitioners for the post of JUNIOR HOSPITAL MEDICAL OFFICER. The Hospital deals with all types of chest disease in medical and surgical wards. Previous experience in resident hospital appointments is desirable. Single accommodation is available.

Applications, stating age, qualifications and experience with the names of 2 referees, should be forwarded to the Group Secretary, Reading and District Hospital Management Committee, 3, Craven-road, Reading.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) RESIDENT CASUALTY OFFICER (Senior House Officer grade) with attachment to Pædiatrician and Ophthalmic Consultant. Salary £745 p.a., less £150 p.a. residential emoluments. Recognised under F.R.C.S. regulations Appointment to commence immediately.

Apply, with full details and references, to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HUDDERSFIELD ROYAL INFIRMARY. (265 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required to commence duties on 1st March, 1957. The post is recognised as a pre-registration appointment and for the F.R.C.S. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.

The Royal Infirmary, Huddersfield.

HULL. VICTORIA HOSPITAL FOR SICK CHILDREN, Park-street. HOUSE SURGEON post vacant 28th February, 1957. Pre-registration post, 6 months duration. Recognised for D.C.H.

Applications, stating age, qualifications, together with 2 testimonials, to Hospital Secretary.

HORNCHURCH. ST. GEORGE'S HOSPITAL, Ingrebourne Centre. Temporary PSYCHIATRIC REGISTRAR required at above Unit. Mental Hospital experience essential. Candidates should be specially interested in short-term therapy and social psychiatry. Further information may be obtained from the Hospital which may be visited by arrangement (Tel. : Hornchurch 4181).

Applications, stating names of 2 referees, should be sent to Group Secretary, Romford Hospital Management Committee, Oldchurch Hospital, Romford, as soon as possible.

HOUNSLOW HOSPITAL. (General Acute—81 Beds.) Applications are invited for the appointment of RESIDENT CASUALTY OFFICER (Senior House Officer grade) recognised for F.R.C.S. examination. Post vacant now. Salary £745 p.a., less £150 p.a. for residence, &c.

Applications, stating age, qualifications, experience, with copies of 3 recent testimonials or names for reference, to the Hospital Secretary, Hounslow Hospital, Staines-road, Hounslow, Middlesex.

HOVE GENERAL HOSPITAL, Sussex. (75 Beds. 3 Resident Medical Officers.) Pre-registration SECOND HOUSE SURGEON AND CASUALTY OFFICER required end of February, or sooner if available, for 6 months. Post is recognised for F.R.C.S. Salary £425–£525, less £125 p.a. for residential emoluments.

Applications, stating age, qualifications, full details of experience, together with names and addresses of 2 referees, to the Administrative Officer.

ILFORD. KING GEORGE HOSPITAL, Eastern-avenue. There will be a vacancy for a HOUSE PHYSICIAN at above Hospital on 22nd March, 1957. First or second post pre-registration. The post will be tenable for 6 months.

Applications, giving full particulars and accompanied by testimonials, should be sent to the undersigned within 7 days of the appearance of this advertisement.

H. F. HARRIS, Group Secretary,
Ilford and Barking Group Hospital Management Committee.

KETTERING AND DISTRICT GENERAL HOSPITAL. CASUALTY OFFICER (Senior House Officer). Recognised for F.R.C.S. The post becomes vacant on 8th April, 1957. It offers wide experience of all traumatic conditions including fractures and some orthopædic cases with charge of 30 Beds.

Applications, accompanied by testimonials, to be sent to the Group Secretary, General Hospital, Rothwell-road, Kettering.

KIRKCALDY GENERAL HOSPITAL, Fife. 2 House OFFICERS required as at 1st April, 1957. The Hospital has 74 general surgical and orthopædic beds and a busy Casualty and Outpatient Department. The posts qualify for pre-registration. Salary in accordance with national scale.

Apply, with copies of 2 recent testimonials, to the Medical Superintendent, East Fife Hospitals Board of Management, 243a, High-street, Kirkcaldy.

LANCASTER MOOR HOSPITAL, Lancaster. (Regional MENTAL HOSPITAL.) Applications invited for post of SENIOR HOUSE OFFICER (resident). Board and residence for unmarried applicant available for which a charge of £150 p.a. is made. Hospital, which has 2700 Beds, serves North Lancashire, Westmorland, and parts of the West Riding of Yorkshire, and has an admission-rate of almost 800 of which 80 % are voluntary. All modern forms of treatment are carried out. Facilities afforded to attend D.P.M. Course. Salary according to national terms and conditions of service.

Apply Medical Superintendent.

LEEDS REGIONAL HOSPITAL BOARD. Registrar vacancies.

General Surgery

Hull Royal Infirmary (80 general surgical beds), and other hospitals in the Hull A Group, including additional duties in the Casualty Department. Non-resident.

Orthopædic Surgery

Harrogate General Hospital (31 orthopædic beds). May include some duties in the Casualty Department. Non-resident.

Obstetrics and Gynæcology

Huddersfield Group (20 gynæcological and 100 obstetric beds). Recognised for M.R.C.O.G. Resident.

Applications, stating age, qualifications, details of present and previous appointments with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 1st March, 1957.

LEEDS. THE UNITED LEEDS HOSPITALS. The GENERAL INFIRMARY AT LEEDS. There is a vacancy for a SENIOR REGISTRAR in the Neurosurgical Centre. The post will be tenable for 1 year in the first instance. Terms and conditions of service for hospital medical staff apply.

Applications, stating age, qualifications, previous posts with dates, and 3 names for reference, to be sent to the Sub-Dean, School of Medicine, Leeds, 2, by 27th February, 1957.

LIVERPOOL. AINTREE HOSPITAL. Fazakerley Group OF HOSPITALS MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER (surgical). Applications are invited from registered medical practitioners. The Hospital is for the treatment of pulmonary and non-pulmonary tuberculosis, and is a main centre for thoracic surgery and has an Orthopædic Department. Salary will be in accordance with terms and conditions of service for hospital medical staff.

Applications, endorsed "Resident Senior House Officer," to be submitted immediately to the Physician-Superintendent.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. LIVERPOOL REGIONAL HOSPITAL BOARD. Applications are invited for temporary appointment to the post of SENIOR REGISTRAR in Surgery to take up duty at the Royal Southern Hospital as soon as possible for the period to 30th September, 1957. The vacancy for the year beginning 1st October, 1957, will be advertised in the summer of 1957.

Apply by 2nd March, 1957, on form obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LOUTH, LINCOLNSHIRE. COUNTY HOSPITAL. (215 Beds.) GRIMSBY HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER (obstetrics and gynæcology), vacant 6th March, 1957, at this busy General Hospital.

Applications with full details, together with names of 2 referees, should be addressed to the Hospital Secretary.

MACCLESFIELD. PARKSIDE HOSPITAL MANAGEMENT COMMITTEE. (1600 Beds.) MANCHESTER REGIONAL BOARD. Applications are invited for the post of REGISTRAR in Psychiatry. Facilities for attending the course for the D.P.M. at Manchester University will be granted and the Hospital is recognised by the Conjoint Board for the purpose of the D.P.M. The Hospital may be visited by appointment.

Applications, with the names of 2 referees, to be sent to the Medical Superintendent, Parkside Hospital, Macclesfield, Cheshire, to reach him by 8th March, 1957.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE SURGEON, 6 months appointment. Post vacant February, 1957. Salary at the rate of £425–£525 p.a. A deduction at the rate of £125 a year is made for board and lodging, and other services provided.

Applications should be forwarded, as soon as possible, to the Administrative Officer at the Hospital.

MALVERN. ST. WULSTAN'S HOSPITAL. (230 Beds.) RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer) required. Good experience in modern treatment of pulmonary tuberculosis. Work mainly medical but Hospital has own Thoracic Surgical Unit.

Applications to Physician-Superintendent.

MANCHESTER (near). PRESTWICH (MENTAL) HOSPITAL. JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER required at above Hospital. Single quarters available. All modern treatments practised, and study facilities granted.

Applications, giving full personal details and the names and addresses of 2 referees, should be sent to the Medical Superintendent, Prestwich Hospital, P.O. Box No. 1, Prestwich, Manchester, not later than Thursday, 28th February, 1957.

MANCHESTER (near). ROYAL MANCHESTER CHILDREN'S HOSPITAL, PENDLEBURY. MANCHESTER REGIONAL HOSPITAL BOARD. SALFORD HOSPITAL MANAGEMENT COMMITTEE. Applications invited for post of RESIDENT MEDICAL REGISTRAR vacant 19th March, 1957. Previous experience in paediatrics essential. Preference given to candidates with M.R.C.P. or other higher qualifications. The Hospital is the chief teaching unit of the University Department of Child Health.

Applications to Group Secretary, Salford Royal Hospital, Salford, 3, before 2nd March, 1957.

MANCHESTER, 9. BOOTH HALL CHILDREN'S HOSPITAL. (380 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER (resident) required for Regional Burns Unit (45 Beds for severe burns and scalds). Post vacant. £170 deducted for full emoluments.

Applications, giving names and addresses of 2 referees, to be sent to Group Secretary, from whom further particulars may be obtained.

MANCHESTER, 8. CRUMPSALL HOSPITAL. Applications are invited from registered or pre-registered practitioners for the post of HOUSE SURGEON in the Department of Obstetrics. Recognised for M.R.C.O.G. Vacant 1st March, 1957.

Applications, with names of 2 referees, by 25th February, 1957, to Group Secretary, North Manchester Hospital Management Committee, Crumpsall Hospital, Manchester, 8.

MANCHESTER REGIONAL HOSPITAL BOARD. SALFORD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for post of REGISTRAR in Surgery (Resident Surgical Officer) at Salford Royal Hospital, vacant 1st April, 1957. Previous experience in surgery essential. F.R.C.S. or higher surgical qualification desirable.

Applications, together with names of 2 referees, to be sent to Group Secretary, Salford Royal Hospital, Salford, 3, before 23rd February, 1957.

MANCHESTER REGIONAL HOSPITAL BOARD. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of REGISTRAR in Radiotherapy at the Christie Hospital and Holt Radium Institute, Manchester. Candidates must hold either the Diploma in Radiotherapy or an F.R.C.S. or M.R.C.P. If the latter they would be eligible for Diploma in Radiotherapy Course commencing in April, 1957.

Applications, with full details, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20, immediately.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. PARK HOSPITAL, DAVYHULME. (General Hospital—433 Beds.) SENIOR HOUSE OFFICER required for Group Laboratory. Post vacant early April, 1957, and tenable for 1 year. Duties which alternate with holder of second similar post include routine general pathology and emergency investigations. Laboratory recognised for D.Path. and D.C.P. examinations. Previous experience not essential.

Application forms from Group Secretary.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (orthopædics) required at the above Hospital, vacant 1st April, 1957. This post offers excellent experience for persons who ultimately intend to specialise in orthopædics and accident work. In addition to the routine orthopædics duties of a general hospital the unit carries out the reconstructive surgical programme of patients from the Devonshire Royal Hospital, Buxton, which has a regional catchment area.

Applications, with full details and names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, as soon as possible.

MANCHESTER, 23. WYTHENSHAWE HOSPITAL. SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (E.N.T.). This post is recognised by the Royal College of Surgeons of England as a Senior House Officer (E.N.T.) post.

Applications, stating age, qualifications, present post, experience and names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20, within 7 days of the appearance of this advertisement.

MARGATE. GENERAL HOSPITAL. (132 Beds.) Senior HOUSE OFFICER (surgical). Recognised for F.R.C.S. and D.A. Salary £745 p.a., less charge for residential emoluments.

Applications, with copies of testimonials, to Hospital Secretary.

MARGATE. ROYAL SEA BATHING HOSPITAL. (Surgical Tuberculosis and Orthopædics—242 Beds.) The post of SENIOR HOUSE OFFICER (1 of 2) is largely an orthopædic one, and affords experience in the treatment of tuberculous and non-tuberculous orthopædic conditions. There is also a Genito-urinary Unit of 35 Beds and a small number of Beds for other tuberculous conditions. The post is recognised for the F.R.C.S., and is suitable for someone reading for a higher surgical examination. Salary £745 p.a., less £150 for residential emoluments.

Applications, with copies of testimonials, to Hospital Secretary.

NEWARK GENERAL HOSPITAL. Nottingham No. 1 HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER (medical) required for above Hospital, situated on Great North-road approximately 20 miles from Nottingham. Post offers good experience. The Consultant staff attending Newark Hospital are on 1 or more of the Nottingham Hospitals. During next few months a flat will be available as married quarters, but in meantime single accommodation can be provided. Salary £775–£50–£1075. Duties to commence as soon as possible.

Applications, giving names of 3 referees, should be sent to Group Secretary, Nottingham No. 1 Hospital Management Committee, General Hospital, Nottingham.

NEWCASTLE GENERAL HOSPITAL. (844 Beds.) NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (general surgery), resident post, vacant 27th February. Recognised for F.R.C.S.

Applications, together with names and addresses of 2 referees, should be sent to the Secretary, Newcastle General Hospital, Newcastle upon Tyne, 4.

NEWCASTLE REGIONAL HOSPITAL BOARD.

REGISTRAR OBSTETRICIAN AND GYNÆCOLOGIST (whole-time), Hartlepools Group of hospitals—Cameron Hospital (41 obstetric and 25 gynæcological beds). Post offers excellent clinical experience and is recognised in obstetrics and gynæcology for M.R.C.O.G. examination. Single or married accommodation available.

REGISTRAR OBSTETRICIAN AND GYNÆCOLOGIST (whole-time), resident, Darlington Group of hospitals—Greenbank Maternity (61 maternity beds) and Darlington Memorial (26 gynæcological beds). Post recognised for M.R.C.O.G. Single accommodation available.

REGISTRAR PLASTIC SURGEON (whole-time), Tees-side Group of hospitals—Hemlington Hospital (50 plastic surgical beds). Also duties at Stockton Children's Hospital, (84 Beds). Single accommodation available.

REGISTRAR SURGEON (whole-time), Tees-side Group of hospitals for general surgical team No. 2—North Ormesby Hospital (184 Beds), Hemlington (214 Beds). Post recognised for F.R.C.S. Single accommodation available.

REGISTRAR SURGEON (whole-time), South Shields Group of hospitals—Ingham Infirmary (158 Beds). Post recognised for F.R.C.S. Single accommodation available.

REGISTRAR ORTHOPÆDIC SURGEON (whole-time), Darlington Group of hospitals—Darlington Memorial (303 Beds). Single accommodation available.

REGISTRAR ANÆSTHETIST (whole-time), Newcastle upon Tyne Group of hospitals—Newcastle General (838 Beds, including special units—i.e., neurosurgical, plastic surgery, &c.). Recognised for F.F.A.R.C.S.

REGISTRAR ANÆSTHETIST (whole-time), South Shields Group of hospitals—General Hospital (602 Beds), Ingham Infirmary (158 Beds). Married or single accommodation available. Post recognised F.F.A.R.C.S.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

REGISTRAR PSYCHIATRIST (whole-time), St. Mary's Hospital, Stannington, near Morpeth (800 Beds). Accommodation for single person available, married man may live out by arrangement if near Hospital and prepared to sleep in when on duty. The person appointed will be able to take the Durham University D.P.M. Course. Further particulars from Regional Psychiatrist.

Applications, with names and addresses of 3 referees, to Regional Psychiatrist, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NOTTINGHAM GENERAL HOSPITAL. Senior House OFFICER (anæsthetics) required about 17th March, 1957. The post is recognised for the D.A. and the F.F.A.R.C.S. This is a busy General Hospital giving experience in all branches of surgery.

Applications, stating age, nationality, qualifications and experience, together with copies of testimonials, to be sent to the Group Secretary.

NOTTINGHAM. CITY HOSPITAL. (811 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (medical). The appointment will be for 1 year.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be sent immediately to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham, from whom particulars may be obtained.

NOTTINGHAM. CITY HOSPITAL. (811 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER at the Department of Thoracic Surgery. Post vacant 24th March, 1957. Salary £745 p.a., less £150 p.a. for residential emoluments. The appointment will be for 1 year.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be submitted immediately to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NORTHAMPTON GENERAL HOSPITAL. (482 Beds.) Vacancies 1st April, 1957, for the following :—

HOUSE OFFICER (general surgery). Recognised for F.R.C.S.

HOUSE OFFICER (Department of Anæsthetics). Recognised for D.A.

HOUSE OFFICER (Fracture and Orthopædic Department). Recognised for F.R.C.S.

HOUSE OFFICER (Casualty Department). Recognised for F.R.C.S.

HOUSE OFFICER (Dermatological Department) (Harborough Road Hospital).

SENIOR HOUSE OFFICER (Casualty Department). Recognised for F.R.C.S.

SENIOR HOUSE OFFICER (Department of Pathology).

SENIOR HOUSE OFFICER (Department of Anæsthetics). Recognised for D.A. & F.F.A.R.C.S.

All posts, except those of Anæsthetic House Officer, Dermatological House Officer and Senior House Officer, recognised for pre-registration. (Casualty House Officer recognised for medical pre-registration.) All 6 months appointments in first instance.

Applications, enclosing copies of 3 testimonials, as soon as possible, to S. G. HILL, Superintendent.

NORWICH. JENNY LIND HOSPITAL FOR CHILDREN. (80 Beds.) NORWICH, LOWESTOFT AND GREAT YARMOUTH (GROUP 6) HOSPITAL MANAGEMENT COMMITTEE. Locum PÆDIATRIC REGISTRAR required for approximately 3 months at the above Hospital.

Applications, with details of experience and names of 2 referees, to Group Secretary, Hospital Management Committee, St. Stephen's-road, Norwich.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL GENERAL HOSPITAL GROUP. DEPARTMENT OF OBSTETRICS AND GYNÆCOLOGY. RESIDENT OBSTETRICAL AND GYNÆCOLOGICAL OFFICER for 1 year in the first instance; salary £850. Renewable for a second year; salary £965. Vacant 1st April, 1957. Recognised for the M.R.C.O.G.

Applications, stating age, nationality, qualifications and experience, with names of 3 referees, to be received by the undersigned not later than 22nd February, 1957.

F. HALL, Deputy Group Secretary.

7, Nelson-gardens, Stoke, Plymouth.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL. SENIOR HOUSE OFFICERS in Anæsthetics, vacant 1st April and 1st May, 1957. Recognised for the D.A. and F.F.A.R.C.S. The appointments will be for a period of 12 months. Applicants to state which date they will be available.

Applications, stating age, nationality, qualifications, and experience, together with the names and addresses of 3 referees, to be sent to the undersigned as soon as possible.

F. HALL, Deputy Group Secretary, Plymouth,
South Devon and East Cornwall General Hospital Group.
7, Nelson-gardens, Stoke, Plymouth.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

(1) **Royal Portsmouth Hospital**

HOUSE SURGEON. 70 Beds. Pre-registration post. Vacant 1st March.

(2) **St. Mary's Hospital** (130 surgical beds)

HOUSE SURGEON (pre-registration) vacant now.

(3) **Queen Alexandra Hospital** (78 medical beds)

HOUSE PHYSICIAN (pre-registration), vacant 15th March, 1957.

Applications, stating age, experience and qualifications, together with the names of 2 referees, should be forwarded as soon as possible to E. H. HURST.

St. Mary's Hospital, Milton-road, Portsmouth.

PORT TALBOT GENERAL HOSPITAL, Hospital-road, PORT TALBOT. (85 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (surgery). Appointment available immediately. The successful applicant will work under the direct supervision of the Consultant Surgeon based on Neath General Hospital, Neath.

Applications, naming 2 referees, to be addressed to the Group Secretary, Mid-Glamorgan Hospital Management Committee, 8, Wind-street, Neath.

PONTYPRIDD (near). EAST GLAMORGAN HOSPITAL, CHURCH VILLAGE. (316 Beds and large Outpatients Department. Committee's base hospital serving population of 174,000. Recognised for D.Obst.R.C.O.G., F.R.C.S., D.C.H., F.F.A.R.C.S., D.A.) PONTYPRIDD AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (surgery).

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent as soon as possible to the Group Secretary, Courthouse-street, Pontypridd.

PONTYPRIDD (near). EAST GLAMORGAN HOSPITAL, CHURCH VILLAGE. (316 Beds and large Outpatients Department serving population of 174,000.) PONTYPRIDD AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (pathology). The appointment to be until 30th September in the first instance. Previous experience in pathology not essential. Emergency duties are shared with other residents.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent to the Group Secretary, Courthouse-street, Pontypridd.

PETERBOROUGH. THE MEMORIAL HOSPITAL. PETERBOROUGH AND STAMFORD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the position of HOUSE SURGEON, vacant 1st April, 1957.

Applications, with testimonials, should be addressed to the Secretary, Memorial Hospital, Peterborough.

READING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (Area Accident and Orthopædic Department), vacant immediately. Recognised for F.R.C.S. Duties including work in area Casualty Department at Battle Hospital, Reading (300 Beds). Person appointed will work with Registrar and House Officers.

Apply, stating nationality, present post and qualifications with dates, together with names of 2 referees, to Group Secretary, 3, Craven-road, Reading.

READING AREA DEPARTMENT OF MEDICINE. Applications are invited from registered and provisionally registered medical practitioners for 2 posts as RESIDENT HOUSE PHYSICIAN, vacant 1st March, 1957, for a period of 6 months. Successful candidates will be required to carry out duties at the following Reading Hospitals: Royal Berkshire (398 Beds), Battle (374 Beds), and Prospect Park (104 Beds).

Write before 19th February, stating age, qualifications with dates, nationality, present post, with copy of 2 recent testimonials, to Secretary, Royal Berkshire Hospital, Reading.

READING. ROYAL BERKSHIRE HOSPITAL. (398 Beds.) Applications are invited from registered and provisionally registered medical practitioners for the resident post of HOUSE PHYSICIAN in the Pædiatric Department, vacant 1st March, 1957, and tenable for 6 months.

Write immediately, stating age, qualifications with dates, nationality, present post, with copy of 1 recent testimonial, to Secretary.

ROCHFORD, ESSEX. GENERAL HOSPITAL. (622 Beds.) HOUSE PHYSICIAN (pre-registration) required, vacant 16th March, 1957.

Applications, &c. (1 testimonial only necessary from pre-registration applicant seeking first post) to be sent to the undersigned by 2nd March, 1957. J. C. FIELD, Secretary.

ROCHFORD, ESSEX. GENERAL HOSPITAL. (622 Beds.) Applications are invited for the resident post of SENIOR HOUSE OFFICER (obstetrics and gynæcology), vacant 26th March, 1957. The appointment is for 1 year and is recognised for the M.R.C.O.G. Applicants must have had previous experience in this specialty. Duties include attendance at ante-natal and gynæcological clinics in the area and supervision of juniors.

Applications, stating age, &c., with copies of recent testimonials, to the undersigned by 2nd March, 1957.

J. C. FIELD, Secretary.

ROCHFORD, ESSEX. GENERAL HOSPITAL. (622 Beds.) HOUSE OFFICER (obstetrics) required. Post vacant 21st March, 1957. Recognised for D.Obst.R.C.O.G. The Hospital has 75 maternity beds, a gynæcological ward of 25 Beds, and a Premature Baby Unit of 8 Cots.

Applications, stating age, &c., to the Secretary at the above Hospital by 2nd March, 1957. J. C. FIELD, Secretary.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) RESIDENT HOUSE SURGEON required from 28th March, 1957, in the General Surgical Unit. Recognised for F.R.C.S. Open to either pre-registration applicants or to fully qualified practitioners. This very active Unit of a total of approximately 180 Beds affords ample opportunities for candidates to obtain first-class tuition and experience. The candidate appointed will be attached to a unit of approximately 60 Beds.

Applications should be forwarded immediately to the Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) SENIOR HOUSE OFFICER (neurosurgery) required immediately. Suitable for candidates seeking higher medical or surgical qualifications. Recognised for the F.R.C.S. (Eng.).

Apply to Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford, as soon as possible.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (99 Beds.) RESIDENT HOUSE SURGEON (Male) required immediately. (Not pre-registration appointment.)

Applications should be forwarded to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. ARBROATH INFIRMARY. General Surgery. Applications are invited for the post of REGISTRAR in General Surgery at Arbroath Infirmary (105 Beds—40 general surgical). Modern house available to rent if required. Salary and conditions of service in accordance with national agreement.

Further particulars and forms of application from the Secretary to the Board, 430, Blackness-road, Dundee, with whom applications must be lodged not later than 23rd February, 1957.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. Obstetrics and Gynæcology. DUNDEE TEACHING HOSPITALS. Applications are invited for the post of RESIDENT REGISTRAR in Obstetrics and Gynæcology at Dundee Royal Infirmary (524 Beds) and Maryfield Hospital (360 Beds), the main general teaching hospitals associated with the University of St. Andrews. The post is recognised for M.R.C.O.G. Applicants should have held house appointments in obstetrics and gynæcology and have had experience in general medicine and surgery. Salary and conditions of service in accordance with national agreement.

Further particulars and forms of application from the Secretary to the Board, 430, Blackness-road, Dundee, with whom applications must be lodged not later than 2nd March, 1957.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. DUNDEE AREA. Thoracic (and Cardiac) Surgery. Applications are invited for the appointment of SENIOR REGISTRAR in Surgery for duty in the Regional Thoracic Surgical Centre at Ashludie Hospital, Monifieth, by Dundee (222 Beds—60 for thoracic surgery) and, in the Cardiovascular Department of the Professorial Surgical Unit at Dundee Royal Infirmary (the principal general teaching hospital associated with the University of St. Andrews—524 Beds). Higher surgical qualification essential. Previous experience in thoracic surgery desirable and experience in general chest medicine an advantage. Salary and conditions of service in accordance with national agreement.

Further particulars and forms of application from the Secretary to the Board, 430, Blackness-road, Dundee, with whom applications must be lodged not later than 2nd March, 1957.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. Obstetrics and Gynæcology. COUNTY AND CITY OF PERTH GENERAL HOSPITALS. Applications are invited for the post of REGISTRAR in Obstetrics and Gynæcology in the area covered by the County and City of Perth General Hospitals (main hospitals, Perth Royal Infirmary (270 Beds) and Bridge of Earn Hospital (806 Beds)). Salary and conditions of service in accordance with national agreement.

Forms of application and further particulars from the Secretary to the Board, 430, Blackness-road, Dundee, with whom applications must be lodged not later than 2nd March, 1957.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. PERTH AREA. Chest Medicine and Tuberculosis. Applications are invited for a temporary appointment as REGISTRAR in Chest Medicine and Tuberculosis in the Perth Area based on Perth Royal Infirmary and Bridge of Earn Hospital. The appointment will be for a period of 12 months. Salary and conditions of service in accordance with national agreement.

Further particulars and forms of application from the Secretary to the Board, 430, Blackness-road, Dundee, with whom applications must be lodged not later than 23rd February, 1957.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. REGISTRAR in the Regional Thoracic Surgery Unit based on the Eastern General Hospital, Edinburgh.

Apply, giving particulars of age, qualifications and previous experience, together with the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 9th March.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. CHILDREN'S HOSPITAL UNIT. Applications invited for the post of MEDICAL REGISTRAR (normally resident) at the above Hospital. Post vacant. Inpatient and outpatient responsibilities. Full opportunities to attend clinical conferences in this and associated hospitals.

Applications, stating age, qualifications and experience, with the names of 3 referees, should be sent not later than 28th February, 1957, to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

SIDCUP, KENT. QUEEN MARY'S HOSPITAL. Resident SENIOR HOUSE OFFICER (anæsthetics) required. Salary £745, less £150 p.a. for residential emoluments. The post is recognised for the F.F.A.R.C.S. and D.A.

Applications, stating nationality, age, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary.

SOUTHEND-ON-SEA GENERAL HOSPITAL. Applications are invited for the appointment of RESIDENT ANÆSTHETIST (Senior House Officer grade). Post vacant 1st April, 1957. Appointment recognised as fulfilling the conditions of the F.F.A.R.C.S. and the D.A.

Applications, stating age, experience and qualifications, with copies of 2 testimonials, should be sent to the undersigned not later than 26th February, 1957. J. C. FIELD, Secretary.

SOUTHAMPTON CHILDREN'S HOSPITAL. (Recognised by Conjoint Board for D.C.H.) HOUSE OFFICER required. Total establishment of 3 residents. Salary, &c., as nationally advocated.

Applications, with copies of testimonials, to be submitted by 23rd February, 1957, to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON GROUP HOSPITALS. South West METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR in Pathology to above Group. The post offers wide experience in all branches of pathology and facilities for research. Candidates may visit the Hospital concerned, by prior arrangement, if they so desire.

Forms of application may be obtained from the undersigned and should be returned not later than Wednesday, 27th February, 1957. There is an immediate vacancy and applicants should state in their initial application if they wish to be considered on a locum basis until the permanent appointment is made.

FRANK JENNINGS, Group Secretary,
Southampton Group Hospital Management Committee.
Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) RESIDENT HOUSE SURGEON required February. Pre-registration candidates eligible.

Applications, with copies of recent testimonials, should be forwarded to Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTH WEST DURHAM HOSPITAL MANAGEMENT COMMITTEE. RESIDENT MEDICAL OFFICER (diseases of the chest). New appointment in Junior Hospital Medical Officer grade for initial period of 4 years. Principal duties at Holywood Hall Hospital, Wolsingham, Bishop Auckland (172 Beds), including major Thoracic Surgical Unit of 20 Beds (tuberculosis and non-tuberculosis); also at Bishop Auckland Chest Clinic (including M.M.R.) and associated hospitals. Furnished or unfurnished accommodation.

Applications, with names and addresses of 3 referees, to the Group Secretary/Finance Officer, The General Hospital, Bishop Auckland, co. Durham, at once.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in E.N.T. Surgery to fill a vacancy in the approved trainee establishment at the South-East Kent Group of hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications, and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 2nd March, 1957.

ST. ALBANS, HERTFORDSHIRE. NAPSBURY MENTAL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER. Appointment to commence immediately. Previous experience as House Physician or House Surgeon essential. Previous psychiatric experience desirable but not essential. Regular clinical case conferences. Good psychiatric library and other training facilities. Salary £745 p.a. Residential accommodation is available, if required, for which a charge will be made. No married quarters.

Applications, with references or testimonials, to be sent not later than 26th February, 1957, to the Medical Superintendent (Telephone: Bowmansgreen 2181).

STOCKPORT AND BUXTON HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER in Psychiatry. The main duties of the post will be at St. Thomas's Hospital, Stockport, with some duties at Stepping Hill Hospital, Stockport, and associated outpatient clinics under the supervision of the Consultant Psychiatrist.

Applications, stating age, experience and qualifications, together with the names of 2 referees, to be forwarded to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport, Cheshire.

STOCKPORT INFIRMARY. Stockport and Buxton HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (non-resident Casualty Officer). Hours of duty: 8.30 A.M.–4.30 P.M. Monday–Friday; 8.30 A.M.–NOON Saturday. The post is recognised under F.R.C.S. regulations and would suit a candidate wishing to study for higher qualifications.

Applications, stating age, qualifications and experience, together with copies of 2 testimonials, to be addressed to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport, Cheshire.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. HOUSE OFFICER (pædiatrics) required. Post vacant 10th March. Pre-registration. Hospital recognised for D.C.H.

Detailed applications, with copy testimonials, to Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. HOUSE OFFICER (general surgery) required. Pre-registration post. Hospital recognised for F.R.C.S.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE OFFICER (general surgery) required. Pre-registration post. Hospital recognised for F.R.C.S.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

SWANSEA HOSPITAL, Swansea. Glantawe Hospital MANAGEMENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER in the Surgical Unit of the above Hospital. Vacancy 1st April, 1957. The post is recognised under the F.R.C.S. (Eng.) regulations.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, should be forwarded to the Hospital Secretary. T. E. JONES, Group Secretary.

SWINDON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications invited for the appointment of SENIOR HOUSE OFFICER as Casualty Officer and Orthopædic House Surgeon at Great Western Hospital, Swindon, vacant on 14th March. Post recognised by R.C.S. for 6 months of years training under Fellowship regulations. Work of Accident and Orthopædic Department, associated with Nuffield Orthopædic Centre (Wingfield Morris Orthopædic Hospital), Oxford, includes large number of industrial injuries. Salary £745 p.a., less £150 p.a. for residential emoluments.

Full details and names of 3 referees to Secretary, 7, Okus-road, Swindon, Wilts, as soon as possible.

SWINDON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. ST. MARGARET'S HOSPITAL, STRATTON. Applications invited for post of RESIDENT SENIOR HOUSE OFFICER for Pædiatric Unit. Post recognised for D.C.H., permits time for postgraduate study; vacant 31st March.

Full details, with names of 3 referees, to Secretary, 7, Okus-road, Swindon, Wilts, as soon as possible.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE PHYSICIAN required for post vacant 29th March. Preference given to persons seeking pre-registration post.

Applications, stating age, experience, and qualifications with dates, with copies of 2 testimonials, to Secretary.

TORQUAY. TORBAY HOSPITAL. Senior Resident HOUSE OFFICER (medicine) required mid-April, 1957. There is a complement of 6 Resident House Officers.

Applications, stating qualifications, age, nationality, with copy testimonials (quoting ref. F.955/78), to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

SUNDERLAND AREA HOSPITAL MANAGEMENT COMMITTEE. RESIDENT ANÆSTHETIST is required for duties at hospitals in the above Group. Senior House Officer grade. Post vacant immediately. The post offers good practical experience under the supervision of the visiting Anæsthetists. The Hospitals are recognised for the F.F.A.R.C.S. and the D.A. In addition every opportunity is given to attend lectures at the neighbouring University 12 miles away.

Apply to the Group Secretary, Sunderland Area Hospital Management Committee, General Hospital, Sunderland, naming 2 referees.

TREDEGAR, MONMOUTHSHIRE GENERAL HOSPITAL. (20 miles from Newport and 24 from teaching hospital at Cardiff; 6 miles from Vale of Usk.) Applications are invited for post of HOUSE SURGEON. Preference given to pre-registration candidates. Surgical unit of 50 Beds and 6 orthopædic beds under daily supervision of Consultant Surgeon and visiting supervision of Orthopædic Surgeon. Busy Outpatient, Casualty and Radiological Departments. Married quarters.

Apply to Group Secretary, address as above by 20th February.

TYNEMOUTH VICTORIA JUBILEE INFIRMARY, Hawkey's-lane, NORTH SHIELDS. Locum RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer or Senior House Officer grade), required for 5 weeks commencing 1st March, 1957.

Applications, with names of 2 referees, to House Governor.

VIRGINIA WATER, SURREY. HOLLOWAY SANATORIUM. Locum Tenens PSYCHIATRIC REGISTRAR required for a period of 3 months. Salary £17 10s. per week. Whitley Council conditions of service.

Write immediately to the Physician-Superintendent.

WAKEFIELD. STANLEY ROYD HOSPITAL. Applications invited for post of JUNIOR HOSPITAL MEDICAL OFFICER in Psychiatry. Salary scale £775–£80–£1075. Married accommodation may be available.

Address written applications, giving full personal particulars, details of training, experience, &c., together with 2 names and addresses for reference, to W. BOWRING, Group Secretary.

Victoria Chambers, Wood-street, Wakefield.

WARRINGTON GENERAL HOSPITAL. (344 Beds.) Applications are invited for the post of RESIDENT ANÆSTHETIST (Male or Female). Graded as Senior House Officer. The Hospital is recognised for the D.A. examination. Salary is £745 p.a., less a deduction of £150 p.a. for residential emoluments.

Applications, stating qualifications and experience, should be sent to— HENRY L. BOOT, Group Secretary,

Warrington and District Hospital Management Committee,

c/o General Hospital, Warrington, Lancs.

WARWICK (near). KING EDWARD VII MEMORIAL CHEST HOSPITAL, HERTFORD HILL, near WARWICK. JUNIOR HOSPITAL MEDICAL OFFICER (resident). Applications are invited for this appointment in a modern Thoracic Surgical Unit. All forms of major and minor thoracic surgery undertaken, post offers wide general training in non-tuberculous and tuberculous surgery. Facilities available for postgraduate study. Previous experience in specialty is not essential.

Applications to Medical Superintendent.

WATFORD CHEST CLINIC, PEACE MEMORIAL HOSPITAL, WATFORD. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications invited for the post (vacant 3rd March) of REGISTRAR at above Clinic, to include duties on the tuberculosis wards (65 Beds) of the associated hospitals. This is a new chest clinic. A car is necessary—usual allowances paid. Experience of refill techniques essential, sanatorium experience desirable. Applicants invited to visit the clinic and should contact the Physician-in-charge.

Application form obtainable from, and returnable to, the Secretary, West Herts Group Hospital Management Committee, 9, Rickmansworth-road, Watford, Herts, by not later than 10 days after the appearance of this advertisement.

WEST HARTLEPOOL. GENERAL HOSPITAL. (471 Beds.) Applications are invited for the post of SENIOR HOUSE PHYSICIAN at the above Hospital, vacant end February.

Applications, stating age, nationality and qualifications with dates, and accompanied by copies of 2 testimonials, should be sent to the Group Secretary, Hartlepools Hospitals Management Committee, at the General Hospital, West Hartlepool, as soon as possible.

WESTON-SUPER-MARE GENERAL HOSPITAL. CASUALTY OFFICER (Senior House Officer grade) required for the above Hospital. The appointment is recognised for F.R.C.S. examinations.

Applications, stating age, qualifications, and experience, together with the names and addresses of 2 referees, should be addressed to the Group Secretary, Weston-super-Mare Hospital Management Committee.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (315 Beds.) HOUSE SURGEON (post recognised by Royal College of Surgeons) required for general surgery with some E.N.T. duties. Approved pre-registration post. Vacant 27th February.

Applications, with copies of 2 testimonials, to the Group Secretary.

WINDSOR. KING EDWARD VII HOSPITAL. Resident ANÆSTHETIC REGISTRAR required. Post recognised for D.A. and F.F.A.R.C.S.

Application forms obtainable from, and returnable to Secretary, Windsor Hospital Management Committee, Alma-road, Windsor, by 24th February.

WINDSOR. KING EDWARD VII HOSPITAL. Clinical ASSISTANT in Ophthalmology required for Wednesday and Friday afternoons. Post vacant 3rd April. Salary £175 p.a. per weekly half-day.

Application form from, and returnable to, Secretary, Windsor Hospital Management Committee, Alma-road, Windsor, by 24th February.

WIGAN AND LEIGH HOSPITAL MANAGEMENT COMMITTEE. E.N.T. REGISTRAR (resident or non-resident) with main duties at Royal Albert Edward Infirmary, Wigan. Recognised F.R.C.S. and D.L.O. Post vacant 1st March, 1957.

Applications to Secretary, Wigan Infirmary, Wigan.

WOKING AND CHERTSEY GROUP HOSPITAL MANAGEMENT COMMITTEE. GROUP PATHOLOGY LABORATORY. REGISTRAR. Opportunities for experience in all branches of pathology in well-equipped, modern laboratory situated at St. Peter's Hospital, Chertsey.

Application forms (closing date 13th March) may be obtained from the Secretary, Hospital Management Committee, Huntingdon, Guildford-road, Chertsey, Surrey.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An Associated Hospital of the Birmingham University Medical School.) HOUSE SURGEON (pre-registration post), vacant now.

Applications, with copies of testimonials, to Secretary.

WORCESTER PARK, SURREY. MASS RADIOGRAPHY UNIT. ASSISTANT MEDICAL OFFICER (Registrar grade). The appointment is whole-time, 7/11ths being devoted to duties with the Surrey Mass Radiography Unit as Assistant Medical Director, and 4/11ths to Chest Clinics in the Woking, Weybridge, and Egham areas, under the supervision of the Consultant Chest Physician. Possession of car necessary for travel between Units: travelling allowance payable at normal rates. Candidates may visit units by local arrangement.

Forms of application, returnable by 28th February, may be obtained from the Group Secretary, St. Helier Hospital, Carshalton, Surrey.

WORCESTER ROYAL INFIRMARY. (213 Beds.) Locum SURGICAL REGISTRAR required for March and April. post offers excellent experience.

Applications, with names and addresses of referees, to be sent immediately to the Hospital Secretary.

WORCESTER ROYAL INFIRMARY. (213 Beds.) House SURGEON (pre-registration or otherwise) for Orthopædic Department required immediately. Post recognised for F.R.C.S. examinations.

Applications to Secretary.

WREXHAM. MAELOR GENERAL HOSPITAL. (591 Beds.) Applications are invited for the post of HOUSE SURGEON at the above Hospital, to commence duties as soon as possible. The appointment is recognised for the Diploma of F.R.C.S. (Eng. and Edin.) and is a pre-registration post.

Applications, stating age, nationality, qualifications and experience, with copies of 2 recent testimonials, to be sent to the Group Secretary, Maelor General Hospital, Wrexham, as soon as possible.

YORK A AND TADCASTER HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER required 18th March, 1957, for the Group Geriatric Unit of 323 Beds based on St. Mary's Hospital, under the direction of a whole-time Consultant Geriatric Physician.

Applications, with details of qualifications, experience, age nationality, and the names of 2 referees, immediately to the Secretary, Bootham Park, York.

YORK. COUNTY, CITY AND YEARSLEY BRIDGE HOSPITALS. Locum Tenens SENIOR HOUSE OFFICER in Paediatrics and Infectious Diseases required 5th–20th March, 1957.

Applications, giving age, nationality, qualifications and names of 2 referees, to Group Secretary, York A and Tadcaster Hospital Management Committee, Bootham Park, York, immediately.

YORK. MATERNITY AND FULFORD HOSPITALS. SENIOR HOUSE OFFICER in Obstetrics and Gynæcology. Required 1st April, 1957. Recognised for M.R.C.O.G.

Applications, stating age, qualifications, experience, nationality, and names of 2 referees, to the Group Secretary, York A and Tadcaster Hospital Management Committee, Bootham Park, York, immediately.

YORK. THE RETREAT. Locum Psychiatrist (Registrar or Senior Registrar grade) required for The Retreat, York, for 6 months.

Apply with names of 2 referees, to the Physician-Superintendent.

NORTHERN IRELAND HOSPITALS AUTHORITY. Applications are invited for a whole-time post as REGISTRAR in Anæsthetics at hospitals managed by the Coleraine and Portrush and North Antrim Hospital Management Committees. The terms and conditions will be in accordance with the application of the Spens report to Northern Ireland.

Applications to be made on a form obtainable (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, 44–46, Queen-street, Belfast, and to be returned not later than 6th March, 1957.

IOWA, U.S.A. IOWA METHODIST HOSPITAL, Des MOINES, IOWA. 400-Bed General Community Hospital fully approved for resident training in all specialties. Also have opportunities for 1-year INTERNS. U.S.A. citizenship and licensure not required. Stipend $175 per month, plus full maintenance for Physician; apartment available for family.

Apply Administrator.

U.S.A. ELMHURST GENERAL HOSPITAL, Elmhurst, NEW YORK, U.S.A. (960 Bed general municipal hospital, formerly New York City Hospital.) Approved by the Joint Commission on Accreditation of Hospitals. Also approved by the American College of Surgeons and American Medical Association for Internship and Residency training. Only graduates from approved university schools accepted. Several openings in Rotating and Straight INTERNESHIPS and a few first and second year RESIDENCIES are available for the term commencing 1st July, 1957. Stipend for Internes is $855 per year plus complete maintenance.

Apply to Chairman of Interne and Resident Committee.

NEW YORK. ALBANY HOSPITAL, Albany, New York, U.S.A. PSYCHIATRY RESIDENCIES available in 655-Bed University-teaching General Hospital with 60-Bed acute treatment Psychiatric Unit fully approved for 3 years training. Experience includes dynamically-oriented psychotherapy with children and adults, shock therapies, and neurologic training Salary range $3000–$4000 annually.

Address inquiries to Medical Director.

Public Appointments

BIRMINGHAM. CITY OF BIRMINGHAM. Public HEALTH DEPARTMENT. Applications are invited for the temporary appointment of 3 Whole-time MEDICAL OFFICERS in the Maternity and Child Welfare Department to take holiday duty during the summer months, commencing 8th April, 1957. The appointments are non-resident and the salary offered is at the rate of £20 2s. 9d. per week. Successful applicants expected to remain, if required, for a period of 6 months.

Application forms obtainable from the Medical Officer of Health, Council House, Birmingham, 3. Completed forms to be returned to him, with copies of 3 testimonials, not later than 25th February, 1957.

BOLTON. COUNTY BOROUGH OF BOLTON. Applications are invited from registered medical practitioners who hold a Diploma in Public Health for the appointment of DEPUTY MEDICAL OFFICER OF HEALTH AND DEPUTY PRINCIPAL SCHOOL MEDICAL OFFICER. Candidates should have had experience in all branches of the Public Health and School Health Services. The person appointed will be expected to undertake the duties of Deputy Medical Referee for the purposes of the Cremation Acts and will be required to devote the whole of his time to the duties of these offices. The inclusive salary is £1576 13s. 4d.–£105(2)–£55–£1841 13s. 4d. p.a. The post is superannuable, subject to 3 months notice on either side, and a medical examination will be necessary.

Applications, stating age, full particulars of experience and qualifications, together with the names and addresses of 3 referees, should be sent to me (quoting reference PH 20) to arrive not later than 6th March, 1957.

Town Hall, Bolton. PHILIP S. RENNISON, Town Clerk.

BRITISH RAILWAYS. Eastern Region. Applications are invited from registered medical practitioners, under 35 years of age, for appointment as ASSISTANT MEDICAL OFFICER in the Eastern Region, British Railways. Candidates should have a good clinical background and an interest in Industrial Medicine. Salary on appointment £1325 p.a. and membership of the superannuation fund, subject to medical examination, obligatory. The successful applicant is likely to be located at Doncaster and will be required to travel throughout the Region for relief purposes.

Applications, giving full particulars of age, qualifications and experience, and 2 references, should be sent to the Regional Medical Officer, Eastern Region, General Offices, Marylebone Station, N.W.1, not later than 28th February, 1957.

CUMBERLAND COUNTY COUNCIL. Applications are invited for the appointment of ASSISTANT COUNTY MEDICAL OFFICER AND SCHOOL MEDICAL OFFICER. Salary within the range £1050–£50–£1200–£55–£1475. Preference will be given to candidates holding a Diploma in Public Health.

Forms of application obtainable from the County Medical Officer, 11, Portland-square, Carlisle. Closing date for applications 28th February, 1957.

G. N. C. SWIFT, Clerk of the County Council.

The Courts, Carlisle, February, 1957.

FACTORY DOCTORS. Factories Acts, 1937 and 1948. The following appointment as Appointed Factory Doctor is vacant. Apply to Chief Inspector of Factories, 19, St. James's-square, London, S.W.1.

District	*County*	*Latest date for receipt of applications*
MARCH ..	.. CAMBRIDGE	.. 2ND MARCH, 1957

FEDERATION OF MALAYA. Senior Pathologist for the Institute for Medical Research, Kuala Lumpur, with extensive knowledge of pathology, morbid anatomy, morbid histology, and preferably some medico-legal work, required for 1 year from June, 1957, to undertake morbid histology of specimens with special reference to the diagnosis of malignant disease.

Appointment is available:—

(*a*) On short-term contract for 1 years resident service. Salary is £2268 p.a. In addition expatriation allowance is paid to married officers without children at rate of £133 p.a. and to married officers with children at rate of £259 p.a. A temporary variable cost-of-living allowance is also payable at rate of £217 p.a. for married men without dependent children and £322 p.a. for married men with dependent children. On satisfactory completion of contract a gratuity of £517 (taxable) is payable.

(*b*) From the National Health Service, retaining superannuation rights. Salary and allowances as at (*a*), but after satisfactory completion of appointment gratuity (taxable) is payable at the rate of 20% of aggregate salary.

Rates of salary and gratuity refer only to persons eligible for expatriate terms under Malayan Regulations (i.e., those whose permanent homes are in United Kingdom, Irish Republic, Australia, Canada, &c.). Candidates must possess qualifications registrable in United Kingdom and a higher qualification in pathology.

Quarters provided if available or generous hotel allowance paid in lieu. 45 days leave on full pay at end of contract. Free passages for Officer, wife, and children under the age of 12 not exceeding 5 persons in all. Climate healthy. Income-tax at local rates.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD. 117/60/039).

NATIONAL COAL BOARD. Durham Division. Assistant AREA MEDICAL OFFICERS required for No. 1 (North East) and No. 6 (North West) Durham Areas. Salary, according to qualifications and experience, will be within the range £1100–£1600 p.a. Candidates with a fair amount of postgraduate experience will not be paid less than £1200. Applicants must be registered medical practitioners. The successful applicants will be required to live within the Area. They should preferably be around 30 years of age and be prepared to make frequent visits underground. The duties include all aspects of industrial medicine.

Applications, quoting reference E.V.162/24 should be submitted within 7 days of publication to Divisional Chief Staff Officer, National Coal Board, Durham Division, Staff Department, 7, Side, Newcastle upon Tyne, 1.

NAVY, ARMY AND AIR FORCE INSTITUTES. Applications are invited from general practitioners in the undernoted towns for the appointment in a part-time capacity as MEDICAL OFFICERS to this Corporation. Successful applicants would be required to examine and report on the condition of employees of the Corporation who may be referred to them from time to time. Fees for this work will be paid on a scale agreed with the British Medical Association.

Applications, giving full details of qualifications and experience, should be sent to Principal Medical Officer, Navy, Army and Air Force Institutes, Kennington-lane, London, S.E.11, not later than 2nd March, 1957. Applicants should not be more than 60 years of age.

The towns for which applications are invited are—

COLCHESTER	IPSWICH	NORWICH
CAMBRIDGE	BURY ST. EDMUNDS	THETFORD
BIGGLESWADE		

TRINIDAD HEALTH DEPARTMENT. Medical Officer (Grade B) (anæsthetics) required for duties under Specialist Anæsthetist, to administer anæsthetics to hospital cases, teach junior officers administration of anæsthetics, and perform other duties as assigned by Director of Medical Services. Candidates should possess qualifications registrable in United Kingdom; and, if possessing D.A., 3 years postgraduate experience. If not possessing D.A. they must have been qualified for 6 years and had special experience in administration of anæsthetics.

Appointment may be made :—

(*a*) From the National Health Service, candidates retaining superannuation rights up to 6 years. Gratuity (taxable) of 20% of aggregate salary on satisfactory completion of appointment.

(*b*) On contract for 2 or 3 years. Gratuity (taxable) of £37 10s. a quarter on satisfactory completion of contract.

Salary scale in both cases £1400–£1500 p.a. Quarters when available at low rental, otherwise allowance in lieu. Free passages for Officer, wife, and children under 18 years, not exceeding 5 persons in all. Generous leave on completion of appointment. Income-tax at local rates.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD.117/38/034).

YORKSHIRE. NORTH RIDING COUNTY COUNCIL. MEDICAL OFFICER in charge of Mobile Clinic. Applications are invited from suitably qualified Women for the above post. The clinic serves a rural area immediately to the North of York. Salary scale £1050–£50–£1200–£55–£1475. Experience in children's diseases and infant feeding is essential: the possession of a D.C.H. and recent experience in a maternity hospital will be considered additional qualifications. Car desirable.

Applications, on a form obtainable from the County Medical Officer, to be returned not later than 2nd March, 1957, to the Clerk of the County Council, County Hall, Northallerton, Yorkshire.

THE MEDICAL SERVICE OF THE ROYAL NAVY

VACANCIES FOR MEDICAL OFFICERS

Candidates are invited for Short Service Commissions of 3 years, on termination of which a gratuity of £600 (tax free) is payable. Ample opportunity is granted for transfer to Permanent Commissions on completion of 1 year's total service. Officers so transferred are paid instead a grant of £1500 (taxable).

All entrants are required to be British subjects whose parents are British subjects, medically qualified, physically fit, and to pass an interview.

Full particulars from the Admiralty Medical Department, Queen Anne's Mansions, St. James's Park, London, S.W.1.

U.S.A.

MENTAL HOSPITAL PHYSICIANS.—These positions involve the performance and supervision of medical care and administrative services for patients in a 2800-Bed mental hospital in the Shenandoah Valley of Virginia. Merit increases, vacation, and sick leave with pay, retirement benefits.

STAFF PHYSICIAN.—2 years of psychiatric experience, at least 1 of which must have been in a mental hospital; licence to practise medicine in State or eligibility therefor; starting salary $8784 per year.

JUNIOR PHYSICIAN.—Graduate from a recognised medical college supplemented by 1 year of rotating internship in an approved hospital; licence to practise medicine in State or eligibility therefor; starting salary $8400 per year.

Apply for the above positions to Superintendent, Western State Hospital, Staunton, Virginia, U.S.A.

General Practice

For an Executive Council post (England and Wales) apply on form E.C.16A obtainable from the council. Mark envelope "Vacancy."

LEEDS (ARMLEY). Applications invited for Vacancy (residential and light industrial) due to resignation. List approximately 1600. Surgery premises available for rental. Intermediate area. Apply on E.C.16A by 9th March, 1957, to the Clerk, Leeds Executive Council, Trevelyan Chambers, 7, Boar-lane, Leeds, 1.

SOUTH AFRICA. Country district, single young Male Assistant for 1 year in 99% native practice. No night work—free week-ends. Some experience of General Practice desirable. Salary £1200 p.a. tax free. Hotel accommodation and car provided. Highest personal references required with names of 2 referees.—Address, No. 279, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Miscellaneous

PROCEEDINGS UNDER SECTION 76 OF THE PATENTS ACT, 1949

Application for correction of specification

N.B.—*The paging referred to is that of printed specification.*

Any person may give notice of opposition to the undermentioned application by filing Patents Form No. 65 within one month from the date of this Journal.

751,799 American Cyanamid Co.

Leave is sought to correct the complete specification as follows :—

Page 7, line 70 (Claim 1): For '0.05%' read '0.5%.'

Locum Tenens required from 19th July to 29th October, 1957, as Medical Officer of Uruwira Minerals Limited, Mpanda, Tanganyika. The successful applicant will be responsible for all medical services with the assistance of a nursing staff of Europeans and Africans, and will be in complete charge of European and African hospitals. Travelling expenses by air will be paid by the Company from the place of engagement to the Mine, and return. The salary offered will be according to qualifications and experience. Accommodation, meals and transport will be provided free by the Company. Applicants must consider the position single status. This mine is situated in the south-west of Tanganyika at an altitude of 3500 ft. and the climate at this time of year is warm and dry. There is railway service to the Mine and twice-weekly air services connecting with Nairobi and Dar es Salaam. There are approximately 160 Europeans including dependants and an African labour force of approximately 2000. This is an excellent opportunity to see something of Africa and to acquire, or broaden, tropical medical experience.

Applications to be addressed to the Manager, URUWIRA MINERALS LIMITED, Mpanda, Tanganyika Territory, British East Africa.

Applications are invited for post as Chief Medical Officer for Tea Garden Practice in Northern India, 3-year agreement renewable. Passages paid, 6 months leave after 3 years. Details of full terms and conditions of appointment on application.—Write, giving full personal particulars, including qualifications and appointments held, to: Address, No. 276, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Trainee-Assistantship, vacant in South-east Kent.—Address, No. 277, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Medical Secretary required by Consultant Physician Good shorthand-typing, education and social background necessary. Previous experience desirable. High salary to suitable applicant.—Address, No. 278, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

To Medical Societies, Hospital Committees, &c. A small Conference-room (20–30) is available in the centre of the London medical world, beautifully furnished with full service. Evenings only.—Apply: H. RICHARDS (MANAGEMENT) LTD., 30, New Cavendish-street, W.1 (Tel.: WELbeck 7561).

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimen of urine and £1 1s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE LTD., 98, Victoria-street, S.W.1 (Phone: VICtoria 0141), who are specialists in this kind of work.

Typewriting and Duplicating. First-class work at moderate prices by experienced medical typists. Electric machines.—SYBIL RANG, 21, Heath-street, Hampstead, London, N.W.3 (HAM 5329/0504).

Professional, technical and personal typewriting. Dupli-cating, circularising, &c., efficiently and speedily executed.—"MOWBRAY," 146, Bishopsgate, E.C.2 (BIS. 2545, BAR. 7665).

Marital and Pre-marital Clinic. The Family Planning Association, 64, Sloane-street, London, S.W.1. Patients may be referred for advice and treatment for sex difficulties. Patients only accepted through doctors, hospitals, and clinics.—Write or telephone (SLOane 0451 or 9112) for details and appointments.

Microscopes. Highest prices paid for good modern types. Send or bring your equipment for valuation.—WALLACE HEATON LTD., 127, New Bond-street, W.1.

The British Journal of Medical Hypnotism. Quarterly, £1 1s. p.a.—Orders to the publishers, 4, Victoria-terrace, Hove, 3, Sussex.

PUBLISHED by the PROPRIETORS, THE LANCET LIMITED, 7, Adam Street, Adelphi, in the County of London.
Printed by HAZELL, WATSON & VINEY, LTD., London and Aylesbury—Saturday, February 16, 1957.
PRINTED IN GREAT BRITAIN—Entered as Second Class at the New York, U.S.A., Office.

Announcing 'Cathomycin'

(SODIUM NOVOBIOCIN) Trade Mark

a new antibiotic of life-saving potential

DISCOVERED IN THE MERCK SHARP & DOHME RESEARCH LABORATORIES

'CATHOMYCIN' is well absorbed when given orally and is indicated principally in the treatment of STAPHYLOCOCCAL INFECTIONS including those resistant to *all other antibiotics.*

'CATHOMYCIN' is also effective in conditions due to susceptible strains of PROTEUS and certain infections due to *streptococcus, diplococcus, corynebacterium* and *pasteurella.*

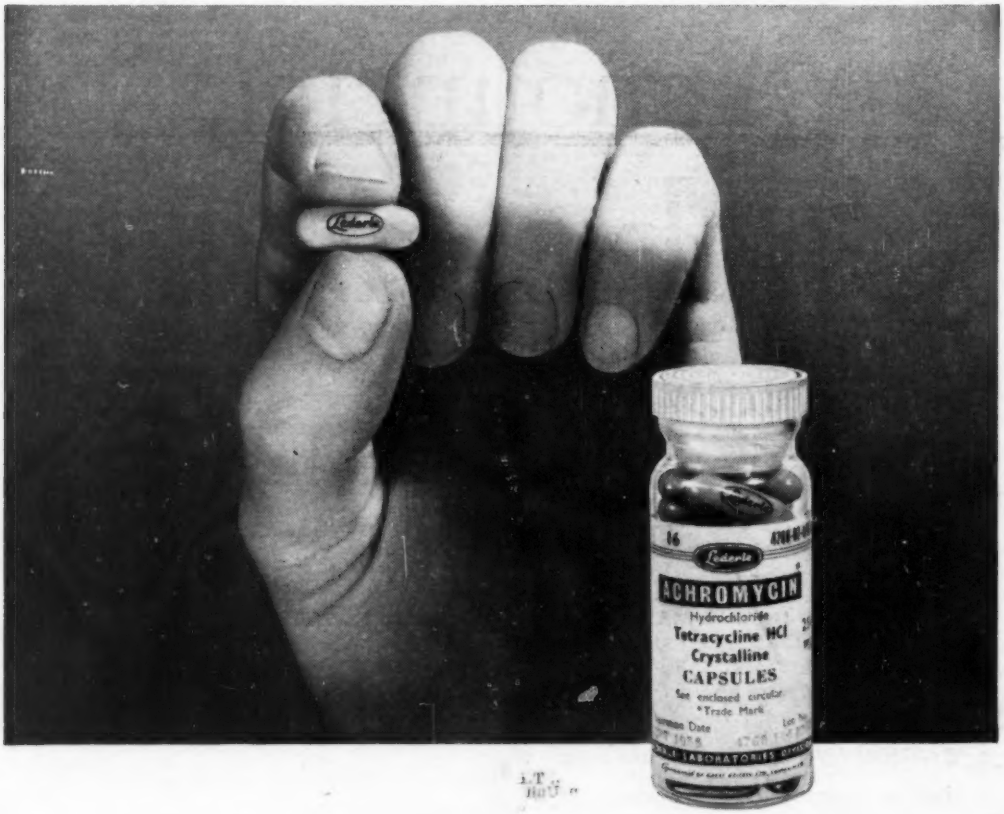
Excellent results have been reported in the following conditions:

Post-operative wound infections
Cellulitis
Staphylococcal septicaemia
Varicose ulcers
Recurrent and persistent carbuncles
Various skin abscesses
Enteritis
Whitlows and paronychiae
Maxillary sinusitis
Osteomyelitis
Infected amputation stump
Infected burns

How Supplied: 'Cathomycin' Tablets are supplied in bottles of 16. Each tablet contains the equivalent of 250 mg. Sodium Novobiocin. Literature gladly supplied on request.

Available for prescription on Form E.C.10.

MSD **MERCK SHARP & DOHME LIMITED, HODDESDON, HERTS**



dispelling the element of doubt

TODAY—with so many antibiotics available—it is always sound practice to specify ACHROMYCIN *by name* whenever true broad-spectrum activity is desired. In this way you are completely assured that the patient receives precisely the treatment you intend. Offered now in no less than fourteen presentations, ACHROMYCIN tetracycline is particularly widely used in capsule form. On every capsule appears the name Lederle—your finest assurance of consistent antibiotic potency and unfailing dependability.

Capsules of 50 mg.—in vials of 25 and 100. Capsules of 250 mg.—in vials of 16 and bottles of 100 and 1000

ACHROMYCIN*

*REGD. TRADE MARK TETRACYCLINE

Also available in the following forms: Ear Solution · Intramuscular · Intravenous · Ointment 3% · Ointment (Ophthalmic) 1% · Ophthalmic Powder Sterilized · Oral Suspension · Liquid Pediatric Drops SPERSOIDS* Dispersible Powder · Soluble Tablets · Syrup · Tablets · Troches

Lederle LEDERLE LABORATORIES DIVISION

Cyanamid OF GREAT BRITAIN LTD., London, W.C.2